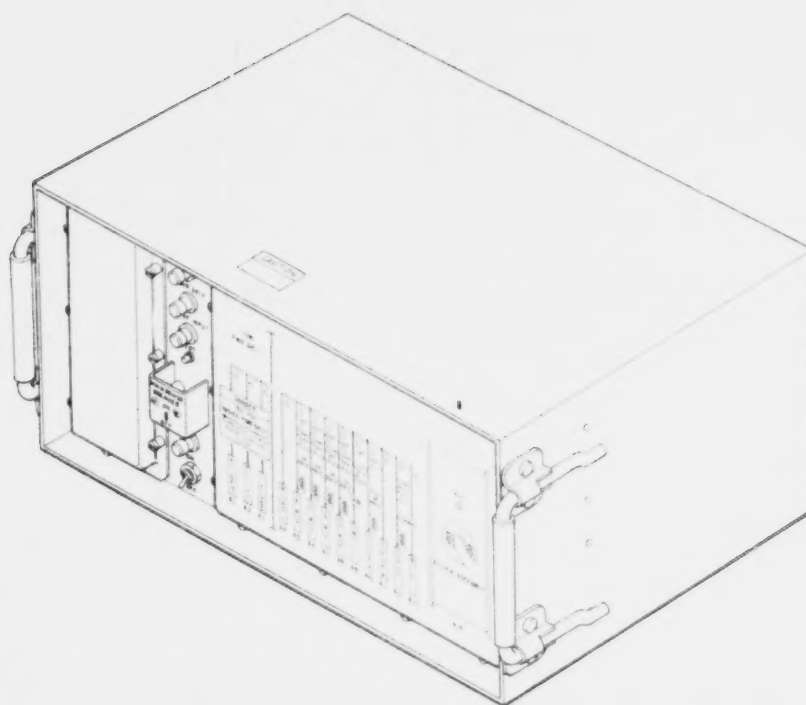


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ARMY TM 11-5805-697-12
NAVY EE163-EG-OMI-010/E154 TD1236
AIR FORCE TO 31W2-2G-351
MARINE CORPS TM 5805-12/2

**OPERATOR'S AND
ORGANIZATIONAL MAINTENANCE
MANUAL**



**MULTIPLEXER
TD-1236/G**
(NSN 5820-01-145-2461)

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DEPARTMENTS OF THE ARMY, THE NAVY, AND
THE AIR FORCE AND THE MARINE CORPS

17 SEPTEMBER 1984

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5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

- 1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL**
- 2 IF POSSIBLE, TURN OFF THE ELECTRICAL POWER**
- 3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL**
- 4 SEND FOR HELP AS SOON AS POSSIBLE**
- 5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION**



- **Ground the Equipment**
- **Avoid the Power Input**
- **Do Not Service Alone**
- **Use One Hand**

HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Observe the following safety precautions:

Before connecting primary power or the signal cables, connect a heavy gage copper wire from the ground lug on the rear panel to earth ground. Do not remove this wire until the signal cables and primary power have been disconnected.

Be careful not to contact the 115-volt ac input connections when installing or servicing the equipment.

Never work on the equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who can administer first aid.

Where possible, use only one hand to service the equipment. Keep the other hand away to reduce the hazard of current flowing through the vital organs of the body.



- **Ventilate**
- **No Smoking**
- **Use Gloves**
- **Wash**
- **Do Not Take Internally**

CLEANING SOLVENT

The fumes of trichlorotrifluoroethane used for cleaning this equipment can cause severe irritation or injury. Observe the following safety precautions:

Use only outside or in well ventilated areas and avoid breathing the fumes.

Do not smoke while using and do not use near an open flame or hot surface. Trichlorotrifluoroethane does not burn but heat converts the fumes to a toxic, irritating gas.

Use gloves that trichlorotrifluoroethane can't penetrate. Because the solvent dissolves the natural oils, avoid long or repeated contact with your skin.

Wash hands immediately after using.

Do not drink. If taken internally, see a doctor immediately.



- **Do Not Lift or Carry Alone**

HEAVY EQUIPMENT

This equipment weighs over 35 pounds and can cause serious injury if lifted or carried alone. Observe the following safety precaution:

Do not attempt to lift, carry, or move the equipment by yourself — get help.

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

LIST OF EFFECTIVE PAGES

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

DATES OF ISSUE for original and changed pages are:

Original..0... 17 September 1984

TOTAL NUMBER OF PAGES in this publication is 116, consisting of the following:

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TM 11-5805-697-12
EE163-EH-OMI-010/E154 TD1236
TO 31W2-2G-351
TM 5805-12/2

Technical Manual
No. 11-5805-697-12
Technical Manual
EE163-EH-OMI-010/E154 TD1236
Technical Order
No. 31W2-2G-351
Technical Manual
No. 5805-12/2

DEPARTMENTS OF THE ARMY,
THE NAVY, AND
THE AIR FORCE
AND THE MARINE CORPS

Washington, DC, 17 September 1984

**OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL
MULTIPLEXER TD-1236/G
(NSN 5820-01-145-2461)**

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, TO 00-5-1. Forward direct to prime ALC/MST.

For Navy, mail comments to the Commander, Naval Electronics System Command, ATTN: ELEX 8122, Washington, DC 20360.

Marine Corps Units should submit NAVMC10772.

In any case, a reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

This manual tells you how to operate and maintain Multiplexer TD-1236/G.

Step-by-step procedures with illustrations give you all the necessary information to install, operate, and maintain this equipment at an organizational level. However, do not attempt any procedure before you first familiarize yourself with the entire procedure.

If you are looking for general information, use the table of contents in the front of this book to locate chapters and sections containing this information.

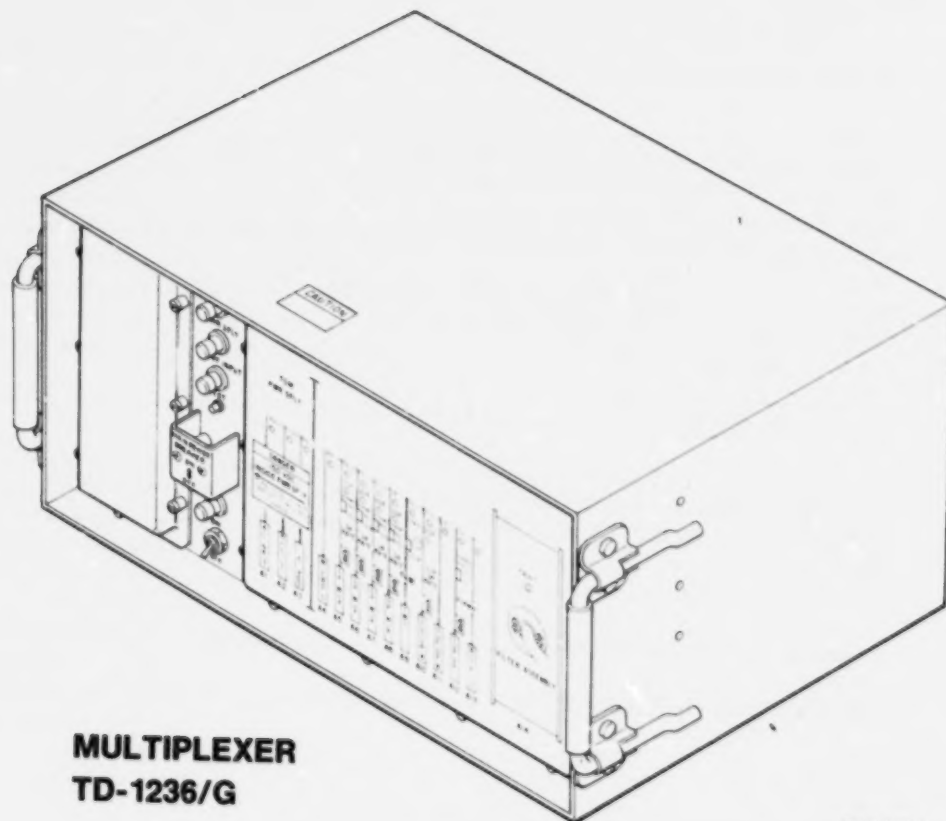
If you are looking for specific information, use the subject index in front of each chapter to locate the paragraph and page where the topic is discussed.

CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION



**MULTIPLEXER
TD-1236/G**

EL1UW001

1-1. SCOPE

This manual provides general description, operation, and operator and/or organizational maintenance instructions for Multiplexer TD-1236/G. Multiplexer TD-1236/G is referred to in this manual as the TGM (Trunk Group Multiplexer).

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed using the Maintenance Data Collection Subsystem (MDCS) in accordance with OPNAVINST 4790.2, Volume 3, and unsatisfactory material conditions (UR submissions) in accordance with OPNAVINST 4790.2, Volume 2, Chapter 17.

REPORT OF DISCREPANCY (ROD)				1. DATE OF PREPARATION		2. REPORT NUMBER		
☐ SHIPPING ☐ PACKAGING								
3. TO (Name and address, include ZIP Code)				4. FROM (Name and address, include ZIP Code)				
5a. SHIPPER'S NAME				5b. NUMBER AND DATE OF INVOICE		6. TRANSPORTATION DOCUMENT NUMBER (GB, Warble, TYN, etc.)		
7a. SHIPPER'S NUMBER (Purchase Order, Shipment, Contract, etc.)		7b. OFFICE ADMINISTERING CONTRACT		8. REQUISITIONER'S NUMBER (Requisition, Purchase Request, etc.)				
9. SHIPMENT, BILLING, AND RECEIPT DATA				10. DISCREPANCY DATA				11. ACTION CODE
NSN/PART NUMBER AND NOMENCLATURE (a)	UNIT OF ISSUE (b)	QUANTITY SHIPPED/BILLED (c)	QUANTITY RECEIVED (d)	QUANTITY (e)	UNIT PRICE (f)	TOTAL COST (g)	CODE (h)	
12. REMARKS (Continue on separate sheet of paper if necessary)								

EL 1UW002

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS—Continued

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c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. HAND RECEIPT (HR) MANUAL

There is no Hand Receipt Manual required for this equipment.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

QUALITY DEFICIENCY REPORT (Category II)							
SECTION I							
1a. From (Originating point)				2a. To (Screening point)			
1b. Typed Name, Duty Phone and Signature				2b. Typed Name, Duty Phone and Signature			
3. Report Control No.	4. Date Deficiency Discovered	5. National Stock No. (NSN)	6. Nomenclature				
7. Manufacturer Mfg. Code/Shipper		8. Mfg. Part No.	9. Serial/Lot/Batch No.	10. Contract/PO/Document No.			
11. Item ☐ New ☐ Repaired/Overhauled		12. Date Manufactured/Repaired/Overhauled		13. Operating Time at Failure		14. Government Furnished Material ☐ Yes ☐ No	
15. Quantity		a. Received		b. Inspected		c. Deficient	
16. Deficient Item a. End Item (Aircraft, tank, ship, howitzer, etc.) b. Next Higher Assembly		(1) Type/Model/Serial		(2) Serial No.		(3) Part No.	
(1) National Stock No. (NSN)		(2) Serial No.		(3) Part No.		(4) Serial No./Lot No.	
18. EIC (Navy)		19. Unit Code/EIC (Navy)		20. Unit Code/EIC (Navy)			

EL1UW004

a. Army. If your Multiplexer TD-1236/G needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. We'll send you a reply.

b. Air Force. Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

c. Navy. Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.

d. Marine Corps. Marine Corps Units shall submit NAVMC10772.

1-6. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the Preventive Maintenance Checks and Services (PMCS) charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

1-7. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2, Procedures for Destruction of Electronic Materiel to Prevent Enemy Use.

1-8. NOMENCLATURE CROSS-REFERENCE LIST

The following list will help you locate the official nomenclature of the major equipment associated with the TGM. Official nomenclature must be used when completing report forms or when using technical manuals.

<u>Common Name</u>	<u>Official Nomenclature</u>	<u>Reference Designation</u>
AC INPUT	Ac Input Circuit Card Assembly	A1
BITE 1	BITE 1 Circuit Card Assembly	A13
FILTER	Filter Assembly	A14
GP MUX	Group Multiplexer Circuit Card Assembly	A5-A8
MICRO C	Microcontroller Circuit Card Assembly	A4
MULTI VDC	Multi Vdc Circuit Card Assembly	A2
SUP GP A	Supergroup A Circuit Card Assembly	A10
SUP GP B	Supergroup B Circuit Card Assembly	A11

1-8. NOMENCLATURE CROSS-REFERENCE LIST—Continued

<u>Common Name</u>	<u>Official Nomenclature</u>	<u>Reference Designation</u>
SUP GP T	Supergroup Timing Circuit Card Assembly	A12
TMG	Timing Circuit Card Assembly	A9
5 VDC	5 Vdc Circuit Card Assembly	A3

1-9. LIST OF ABBREVIATIONS

Abbreviations are spelled out the first time they appear in text. However, a complete list of all abbreviations used in this manual is given below as an additional aid to knowing their full meaning. Acronyms also are included.

<u>Abbreviation/Acronym</u>	<u>Definition</u>
BITE	Built-In Test Equipment
CCA	Circuit Card Assembly
DGM	Digital Group Multiplexer
DISREP	Discrepancy in Shipment Report
EIR	Equipment Improvement Recommendation
FSCM	Federal Supply Code for Manufacturers
GM	Group Modem (Modem, Digital Data MD-1026(P)/G)
GND	Ground
GP	Group
GP MUX	Group Multiplexer
HR	Hand Receipt
HSCDM	High Speed Cable Driver Modem (Modem, Cable Driver MD-1024/G)
kb/s	Thousand Bits per Second
LED	Light Emitting Diode

1-9. LIST OF ABBREVIATIONS—Continued

<u>Abbreviation/Acronym</u>	<u>Definition</u>
LGM	Loop Group Modem (Multiplexer TD-1235(P)/TTC)
LOI	Loss of Input
LSCDM	Low Speed Cable Driver Modem (Modem, Cable Driver MD-1023(P)/G)
MAC	Maintenance Allocation Chart
MDCS	Maintenance Data Collection Subsystem
MGM	Master Group Multiplexer (Multiplexer TD-1237(P)/G)
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Orders
NRZ	Nonreturn to Zero
OOF	Out of Frame
PMCS	Preventive Maintenance Checks and Services
RLGM/CD	Remote Loop Group Modem/Cable Driver (Modem, Cable Driver MD-1025/G)
RPSTL	Repair Parts and Special Tools List
ROD	Report of Discrepancy
SUP GP	Supergroup
TED	Trunk Encryption Device
TGM	Trunk Group Multiplexer (Multiplexer TD-1236/G)
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TMG	Timing
TO	Technical Order

Section II. EQUIPMENT DESCRIPTION

1-10. PURPOSE

The TGM is a digital group multiplexing (DGM) device used in multichannel communication systems. It has two primary functions. One is to multiplex up to four digital group inputs of various rates into a supergroup. The other is to demultiplex a supergroup into separate groups each at its own rate.

1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES, FEATURES, AND USES

a. Characteristics.

- Shelter and rack mounted
- Powered from standard 115-Vac line
- Interfaces with many different DGM equipments

b. Capabilities.

- Synchronous multiplexing
- Synchronous demultiplexing
- Operates from internal or external clock

c. Features.

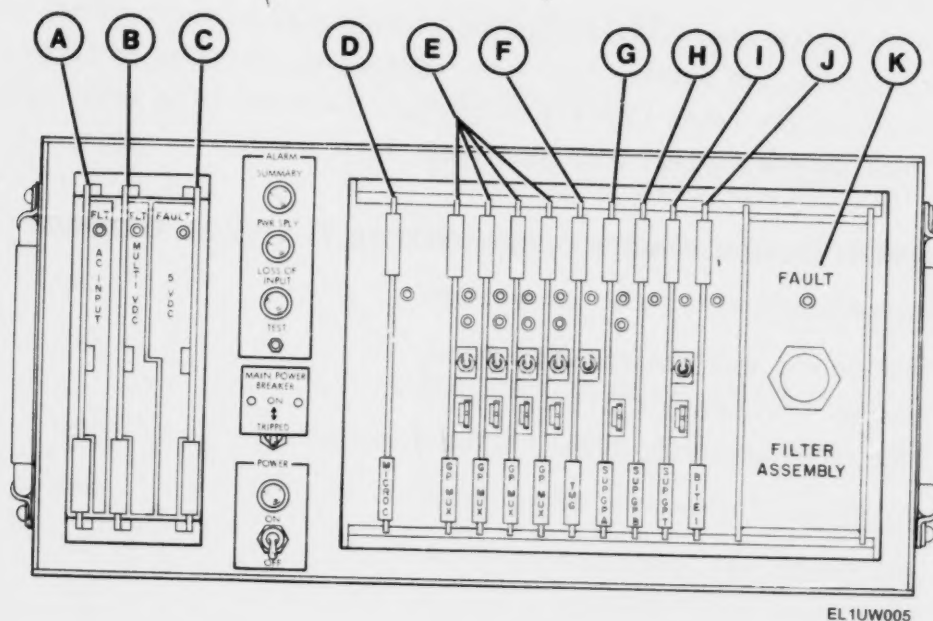
- Simple operation
- Built-in test equipment
- Rapid access to assemblies for ease of repair

d. Used With.

- AN/TRC-173
- AN/TRC-170V1
- AN/TRC-170V2
- AN/TRC-170V3

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

All major components of the TGM are in a metal case which may be rack mounted.



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NOTE

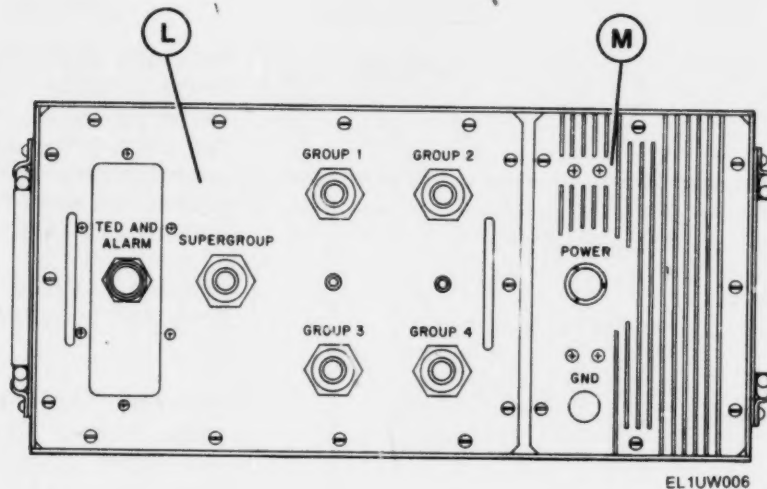
Reference designators are shown on TGM cover.

Key	Name	Reference Designation	Function
A	AC INPUT CCA	A1	Provides rectified ac, sums system faults, drives indicator lamps, and initiates nuclear shutdown.
B	MULTI VDC CCA	A2	Provides -5, +12 and -12 Vdc.
C	5 VDC CCA	A3	Provides +5 Vdc.
D	MICRO C CCA	A4	Controls frame sensing logic.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS—Continued

<u>Key</u>	<u>Name</u>	<u>Reference Designation</u>	<u>Function</u>
(E)	GP MUX CCA	A5-A8	Provides delay storage, frame sensing logic, and retiming logic required for each group input/output signal. Buffers timing between input groups and TGM.
(F)	TMG CCA	A9	Provides timing and control for supergroup output.
(G)	SUP GP A CCA	A10	Provides interface circuits, delay storage, and frame sampling logic for supergroup input.
(H)	SUP GP B CCA	A11	Combines aligned group data for four groups into one supergroup output.
(I)	SUP GP T CCA	A12	Provides timing and logic to demultiplex frame aligned supergroup input.
(J)	BITE 1 CCA	A13	Detects and indicates faults in TGM.
(K)	Filter Assembly	A14	Filters and buffers selected signals.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS—Continued



<u>Key</u>	<u>Name</u>	<u>Function</u>
(L)	Connector Assembly	Interfaces TGM with other equipment.
(M)	Connector Assembly	Connects TGM to 115 Vac.

1-13. APPLICATIONS

The TGM is installed in shelters or vans. It interfaces with other DGM and non-DGM units in a number of interconnection arrangements. These arrangements are those required by the communications system in which it operates. The TGM may interface with, but is not necessarily limited to, the following equipment:

- a. Trunk Encryption Device KG-81 (TED)
- b. Multiplexer TD-1235(P)/TTC (LGM)
- c. Multiplexer TD-1236/G (TGM)
- d. Multiplexer TD-1237(P)/G (MGM)
- e. Modem, Cable Driver MD-1023(P)/G (LSCDM)
- f. Modem, Cable Driver MD-1024/G (HSCDM)
- g. Modem, Cable Driver MD-1025/G (RLGM/CD)
- h. Modem, Digital Data MD-1026(P)/G (GM)
- i. Station Clock Generating Unit

1-14. PERFORMANCE DATA

- a. Group Side (Up to Four).
 - Transmit Data - Waveform - NRZ, balanced
 - Transmit Timing - Waveform - Squarewave, balanced
 - Receive Data - Waveform - NRZ, balanced
 - Receive Timing - Waveform - Squarewave, balanced
- b. Supergroup Side.
 - Transmit Data - Waveform - NRZ, balanced
 - Transmit Timing - Waveform - Squarewave, balanced
 - Receive Data - Waveform - NRZ, balanced
 - Receive Timing - Waveform - Squarewave, balanced
- c. Station Clock Input.
 - Waveform - Squarewave, balanced

1-14. PERFORMANCE DATA—Continued

d. Interface Signals.

- Supergroup TED Resync Command - Waveform - Pulse, balanced
- Group 1, 2, 3 and 4 TED Resync Command - Waveform - Pulse, balanced
- Frame Squelch - Waveform - DC Level, unbalanced

e. Prime Power.

- Ac Input - 104 to 126 volts (ac), 47 Hz to 420 Hz, 60 Watts nominal

f. Environmental Characteristics.

(1) Temperature

- Operating - -25°F to +145°F (-32°C to +63°C)
- Storage - -70°F to +160°F (-57°C to +71°C)

(2) Humidity

- Operating and Storage - Tropical levels

(3) Altitude

- Operating - 10,000 feet maximum
- Air Transportation - 40,000 feet maximum

g. Physical Characteristics.

(1) Dimensions

- Height - 8.5 inches
- Depth - 12 inches
- Width - 19 inches

(2) Weight - 35 pounds

(3) Type of Mounting - 19-inch rack

h. Alarms.

- S - Summary fault
- SA - Summary fault except for loss of sync

1-14. PERFORMANCE DATA—Continued**i. TGM Interconnection Data Tables.****512 kb/s FAMILY GROUP RATE**

Input Bit Rates (kb/s)				Output Bit	Frame
Input No. 1	Input No. 2	Input No. 3	Input No. 4	Rate (kb/s)	Format Switch
2048 ⁽⁴⁾	2048	0	0	4096 ⁽⁴⁾	3 (A1)
2048	1024	1024	0	4096	1 (B)
2048	256-1024	0,256-512	0,256-512	4096	0 (C)
1024	1024	256-1024	0,256-1024	4096	2 (A3)
1024	512	512	256-512	4096	2 (A3)
1024	1024	0	0	2048	3 (A1)
1024	512	512	0	2048	1 (B)
1024	128-512	0,128,256	0,128,256	2048	0 (C)
512	512	128-512	0,128,512	2048	2 (A3)
512	256	256	128,256	2048	2 (A3)
512	512	512	0	1536 ⁽²⁾	4 (A2)
512	512	0	0	1024	3 (A1)
512	256	256	0	1024	1 (B)
512	128-256	0,128	0,128	1024	0 (C)
256	256	128-256	0,128-256	1024	2 (A3)
256	128	128	128	1024	2 (A3)
512	0	0	0	512*	7 (S.C.)
256	256	0	0	512	3 (A1)
256	128	0,128	0	512	1 (B)
128	128	128	0,128	512	2 (A3)
256	0	0	0	256*	7 (S.C.)
128	128	0	0	256	3 (A1)
128	0	0	0	128*	7 (S.C.)

* The overhead and traffic bit relationship is identical to the input overhead and traffic bit relationship.

NOTES:

- (1) X-Y means X or Y or any standard intermediate bit rate; e.g., 128-1024 means 128, 256, 512 or 1024.
- (2) For the 512, 512, 512, 0 kb/s input bit rate combination, both 2048 and 1536 kb/s output rates are applicable, and the required output rate shall be switch selectable.
- (3) 128 kb/s input group rate will only be utilized with a 16 kb/s channel rate.
- (4) With 16 kb/s channels, the maximum output bit rate is 2048 kb/s (128 channels), and the maximum input bit rate is 1024 kb/s (64 channels).

1-14. PERFORMANCE DATA—Continued

576 kb/s FAMILY GROUP RATE

Input No. 1	Input Bit Rates (kb/s)			Output Bit Rate (kb/s)	Frame Format Switch
	Input No. 2	Input No. 3	Input No. 4		
2304	2304	0	0	4608	3 (A1)
2304	1152	1152	0	4608 ⁽³⁾	1 (B)
2304	288-1152	0,288-576	0,288-576	4608	0 (C)
1152	1152	288-1152	0,288-1152	4608	2 (A3)
1152	576	576	288-576	4608	2 (A3)
1152	1152	0	0	2304	3 (A1)
1152	576	576	0	2304	1 (B)
1152	144-576	0,144,288	0,144,288	2304	0 (C)
576	576	144-576	0,144,576	2304	2 (A3)
576	288	288	144-288	2304	2 (A3)
576	576	0	0	1152	3 (A1)
576	288	288	0	1152	1 (B)
576 ⁽⁴⁾	144,288	0,144	0,144	1152	0 (C)
288	288	144,288	0,144,288	1152	2 (A3)
288	144	144	144	1152	2 (A3)
576	0	0	0	576*	7 (S.C.)
288	288	0	0	576	3 (A1)
288	144	0,144	0	576	1 (B)
144	144	144	0,144	576	2 (A3)
288	0	0	0	288*	7 (S.C.)
144	144	0	0	288	3 (A1)
144	0	0	0	144*	7 (S.C.)

* The overhead and traffic bit relationship is identical to the input overhead and traffic bit relationship.

NOTES:

- (1) X-Y means X or Y or any standard intermediate bit rate; e.g., 144-1152 means 144, 288, 576 or 1152.
- (2) 144 kb/s input group rate will only be utilized with a 16 kb/s channel rate.
- (3) With 16 kb/s channels, the maximum output rate is 2304 kb/s (144 channels), and the maximum input bit rate is 1152 kb/s (72 channels).
- (4) This line restricted to 16 kb/s channel rate.

1-14. PERFORMANCE DATA—Continued

TGM/RLGM OPERATION

Input Bit Rates (kb/s)				Output Bit Rate (kb/s)	Frame Format Switch
Input No. 1	Input No. 2	Input No. 3	Input No. 4		
144	---	---	---	288 (9 ch)	6 (D2)
144	144	---	---	288 (9 ch)	6 (D2)
144	144	144	---	576 (18 ch)	5 (D1)
144	144	144	144	576 (18 ch)	5 (D1)

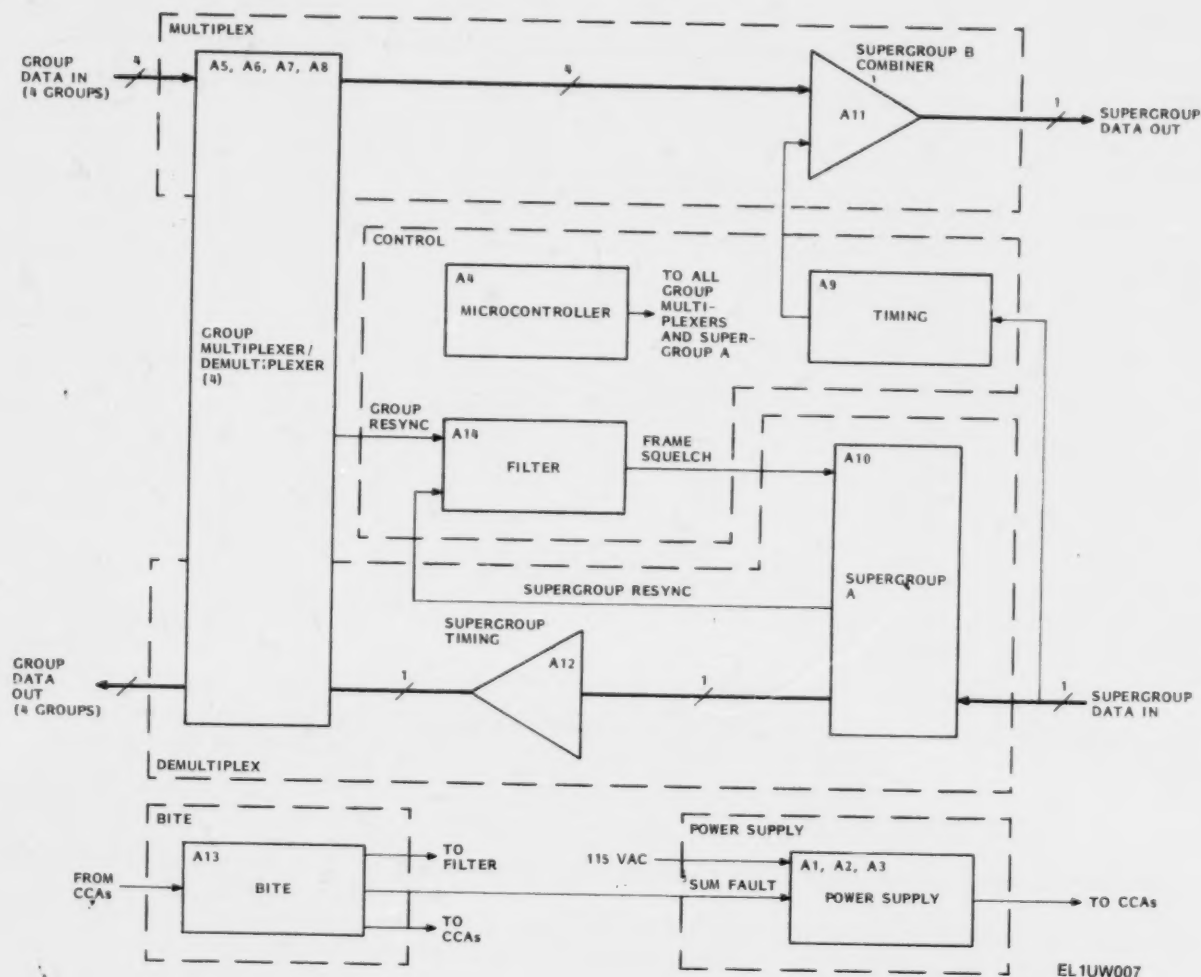
NOTE: Bit rates reduced by a factor of two when loop rate is reduced to 16 kb/s.

Section III. PRINCIPLES OF OPERATION

1-15. TGM FUNCTIONAL DESCRIPTION

The TGM has five functional groups:

- Multiplex
- Demultiplex
- Control
- BITE
- Power Supply



a. Multiplex. Up to four group data (traffic) streams are multiplexed to form a supergroup. Group data comes from other equipment. Supergroup data goes to other equipment.

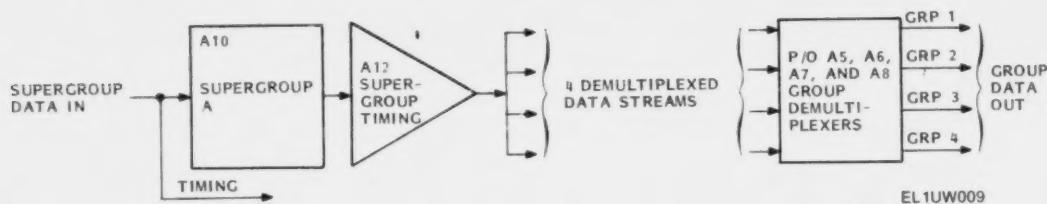
1-15. TGM FUNCTIONAL DESCRIPTION—Continued



Group multiplexers (P/O A5 through A8) receive, frame, time, and store group data. There is one group multiplexer for each group. Control signals cause group multiplexers to send stored group data to supergroup B (A11).

Supergroup B combines group data to make a supergroup and sends the supergroup data to other equipment.

b. Demultiplex. Supergroup data received from other equipment is demultiplexed into group data streams. As many as four groups may be in the supergroup.



Supergroup A (A10) receives supergroup data, aligns it with a local frame reference, and sends it to supergroup timing (A12).

Supergroup timing applies a group time reference and separates the supergroup data into group data. The group data then goes to the group demultiplexers (P/O A5 through A8).

Group demultiplexers receive and hold aligned and framed group data. Control signals cause group multiplexers to send held group data to other equipment.

1-15. TGM FUNCTIONAL DESCRIPTION—Continued

c. Control. The control group gets:

- A supergroup time reference
- Group timing data
- Frame squelch commands

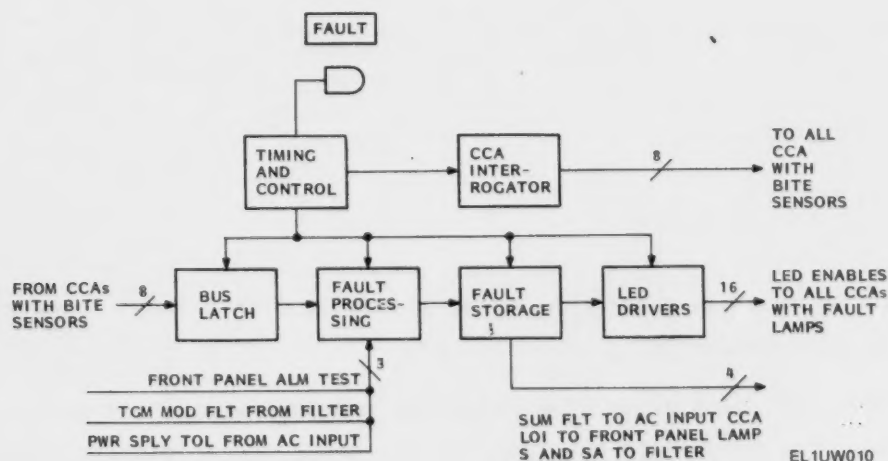
It generates:

- A local time base
- Group resync commands
- Supergroup resync commands

The microcontroller controls frame sensing and alignment in both multiplexing and demultiplexing.

The filter assembly filters and shields selected control signals used in the TGM and sent to other equipment.

d. BITE. BITE circuits monitor TGM circuits for faults, assign priorities to faults, light fault alarm indicators, and send fault alarms to other equipment. There are three kinds of fault alarms:



EL1UW010

- An S-alarm is generated when BITE has detected a fault. It lights the SUMMARY alarm lamp on the front panel and sends an S-alarm signal to a rear panel connector.

Sl
ec
1-

1-15. TGM FUNCTIONAL DESCRIPTION—Continued

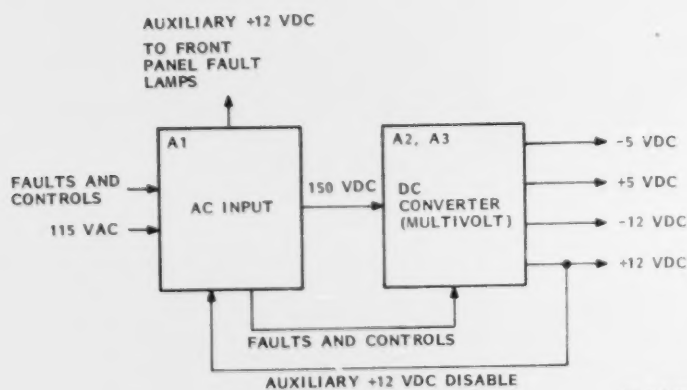
- An SA-alarm is generated when BITE has detected a fault within the TGM circuits. It sends an SA-alarm signal to a rear panel connector.
- An LOI-alarm is generated when BITE has detected a loss of input to the TGM. It lights the LOI-alarm lamp on the front panel.

When BITE detects faults on a logic CCA, it lights a LED on the CCA; it also generates S- and SA-alarms. The S-alarm lights the SUMMARY alarm lamp.

If more faults than one are present, BITE assigns priorities to the faults. Only the fault with highest priority will cause an LED on a CCA to light. When the highest priority fault is cleared (by replacing the CCA), the LED goes out. The LED on the CCA having the next higher priority lights. This is done because a fault on one CCA may cause a BITE sensor on a second CCA to sense a fault on the second CCA. Without a priority assignment, LEDs would light on both CCAs. Replacing the second, but not the first, CCA would not clear the fault. Replacing the first CCA would clear the fault indication on both CCAs.

e. Power Supply. The power supply gets a single-phase, 115 Vac input and supplies the dc outputs needed to operate the TGM. The power supply has two functional groups:

- Ac Input
- Dc Converter



1-15. TGM FUNCTIONAL DESCRIPTION—Continued

The ac input function converts 115 Vac to +12 Vdc and 150 Vdc outputs. The +12 Vdc output is an auxiliary supply to light front panel lamps. The 150 Vdc output goes to a dc converter. Fault and control inputs to the ac input function control operation of the power supply.

The dc converter (A2 and A3) gets a 150 Vdc input and converts it to plus (+) and minus (-) 5 Vdc and 12 Vdc outputs; it also sends an auxiliary +12 Vdc DISABLE signal to the ac input. This signal causes the ac input function to stop its auxiliary +12 Vdc output to front panel lamps.

CHAPTER 2

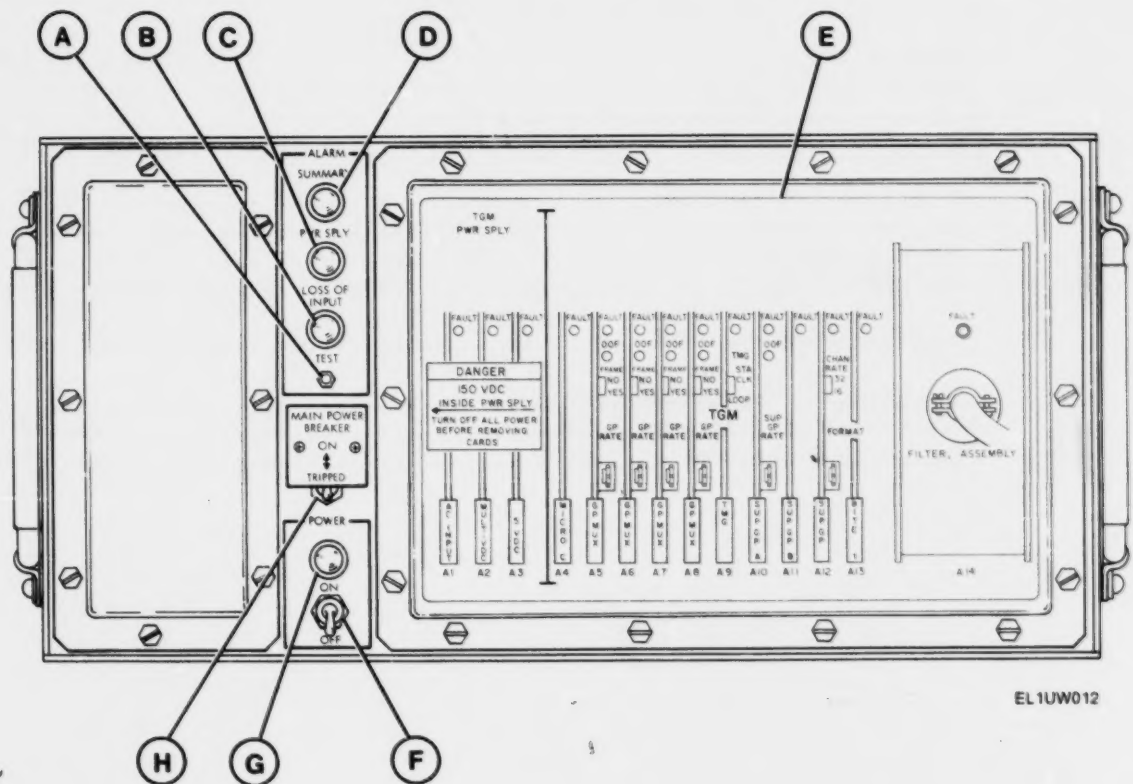
OPERATING INSTRUCTIONS

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Section I Description and Use of Operators Controls and Indicators	2-2
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2-2 Rear Panel Connectors	2-4
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Section I. DESCRIPTION AND USE OF OPERATORS CONTROLS AND INDICATORS

2-1. FRONT PANEL CONTROLS AND INDICATORS

All TGM operator controls and indicators are located on the front panel. All other controls and indicators are located on the CCAs and are for maintenance and system setup.

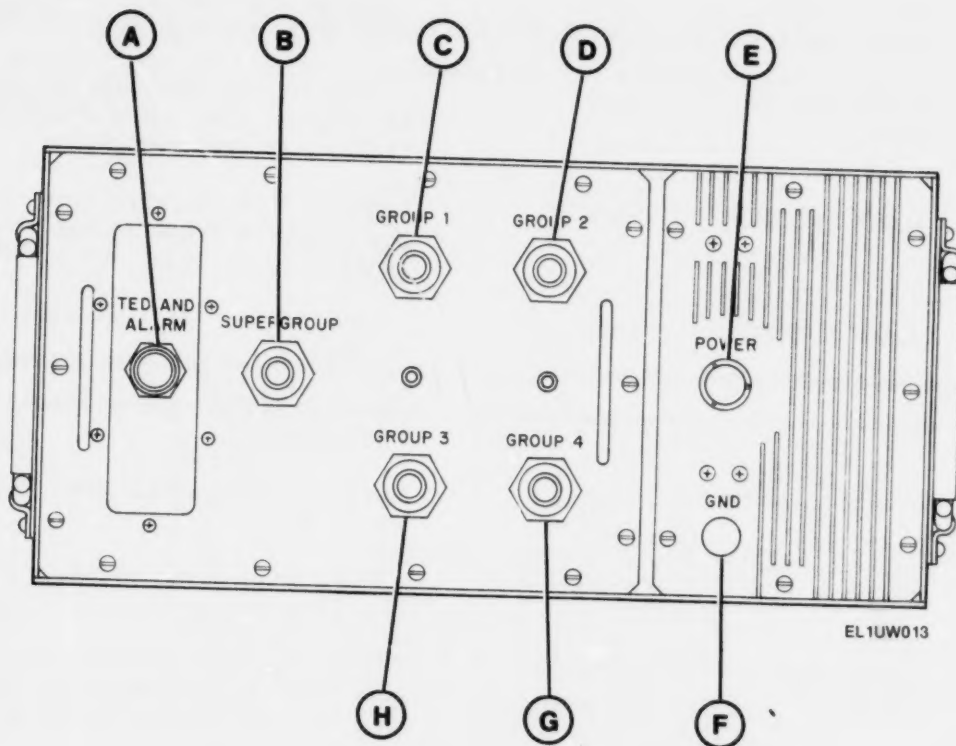


The label on the front panel shows the locations of all CCAs and CCA-mounted controls and indicators. The label is a handy reference for use during maintenance and system setup. Switch settings may be marked on the label with a grease pencil.

2-1. FRONT PANEL CONTROLS AND INDICATORS—Continued

<u>Key</u>	<u>Name</u>	<u>Type</u>	<u>Function</u>
(A)	ALARM TEST	Pushbutton	Energizes the BITE circuits in a test mode to light all fault lamps on the TGM, and all fault LEDs on A4 through A13.
(B)	ALARM LOSS OF INPUT	Lamp	Lights if the TGM loses an external input. The appropriate CCA fault lamp also lights.
(C)	ALARM PWR SPLY	Lamp	Lights if one or more power supply output voltage is out of tolerance.
(D)	ALARM SUMMARY	Lamp	Lights if any fault is detected by the TGM.
(E)	LABEL	Label	Identifies internal controls and indicators.
(F)	POWER ON/OFF	Toggle Switch	Switches 115 Vac to power supply ON or OFF.
(G)	POWER	Lamp	Lights when power to power supply circuits is ON.
(H)	MAIN POWER BREAKER	Circuit Breaker	Trips when an overload exists in the TGM. Can be reset by throwing circuit breaker to ON position.

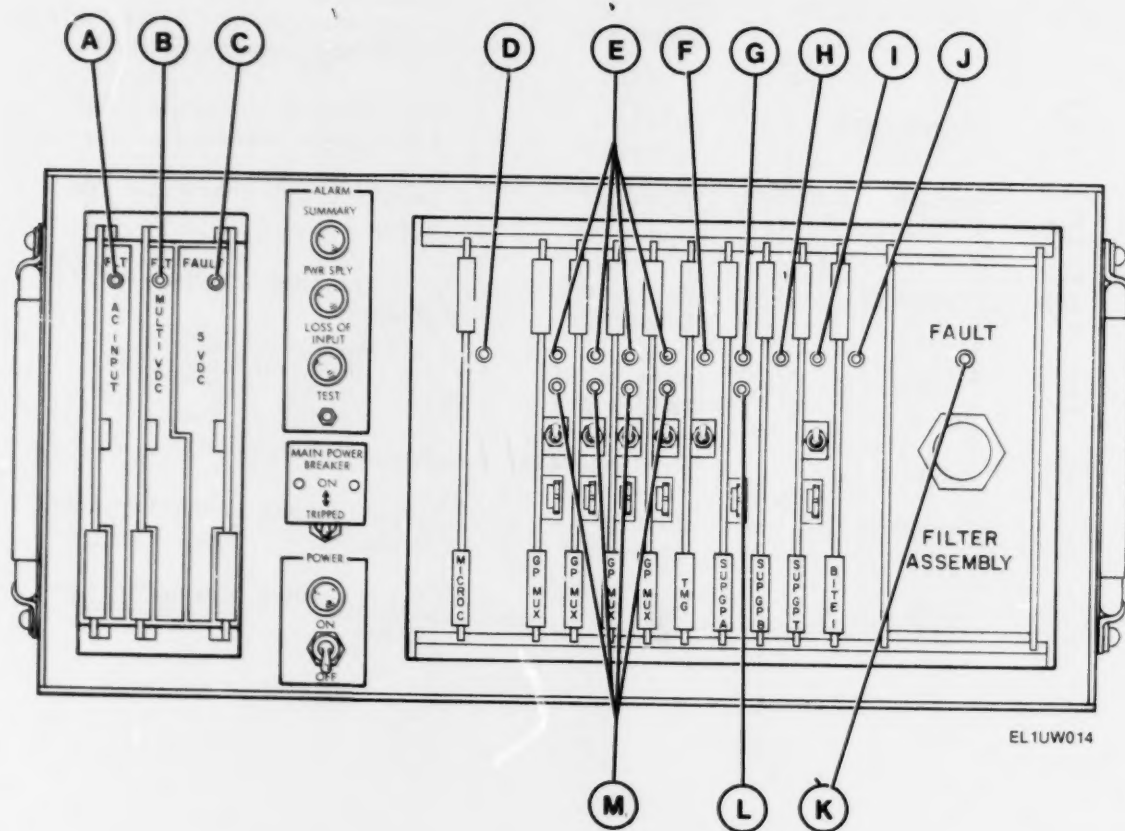
2-2. REAR PANEL CONNECTORS



2-2. REAR PANEL CONNECTORS—Continued

<u>Key</u>	<u>Name</u>	<u>Type</u>	<u>Function</u>
(A)	TED AND ALARM	Multipin Connector	Input/output connector for trunk encryption device, alarm, and frame squelch signals.
(B)	SUPERGROUP	Multipin Connector	Input/output connector for supergroup signals.
(C)	GROUP 1	Multipin Connector	Input/output connector for group 1.
(D)	GROUP 2	Multipin Connector	Input/output connector for group 2.
(E)	POWER	Part of RFI Filter FL1	Ac line power connector.
(F)	GND	Binding Post	Ground connector.
(G)	GROUP 4	Multipin Connector	Input/output connector for group 4.
(H)	GROUP 3	Multipin Connector	Input/output connector for group 3.

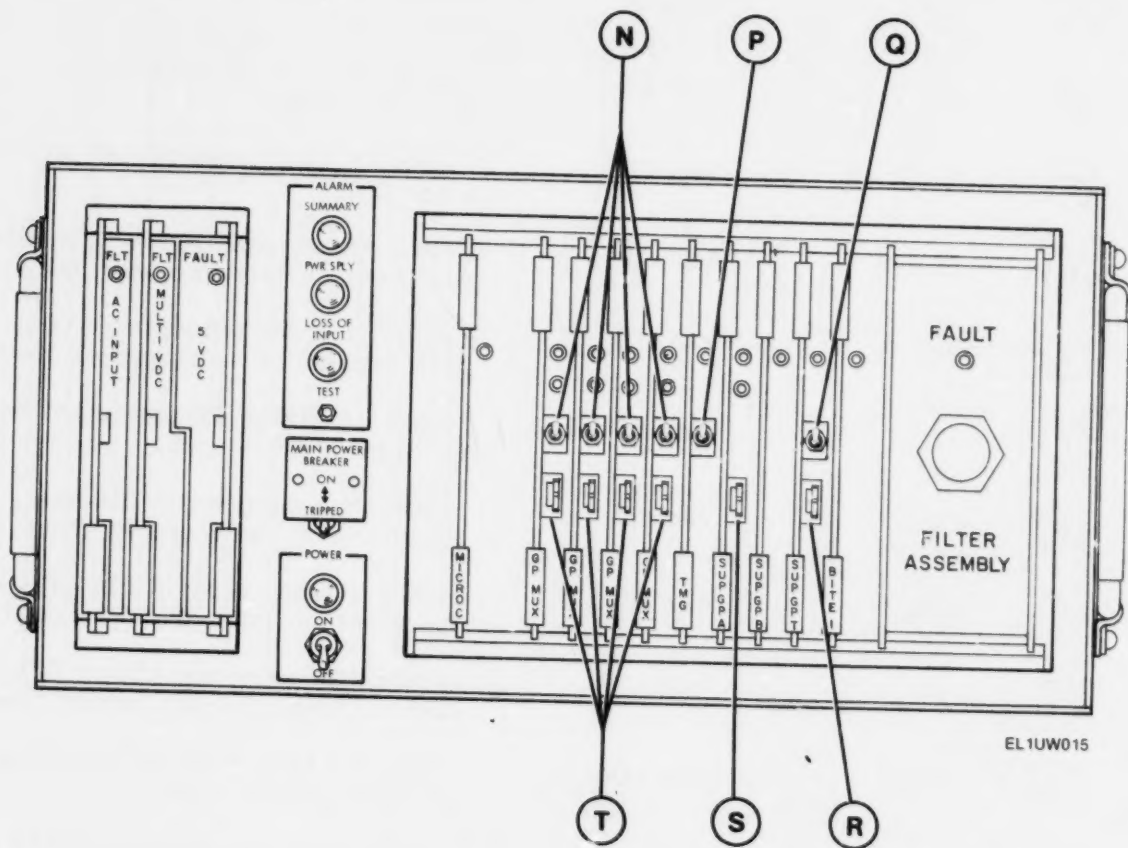
2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS



2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

<u>Key</u>	<u>Name</u>	<u>Type</u>	<u>Function</u>
(A)	FAULT	Red LED	Lights if fault is detected on ac input CCA.
(B)	FAULT	Red LED	Lights if fault is detected on multi Vdc CCA.
(C)	FAULT	Red LED	Lights if fault is detected on 5 Vdc CCA.
(D)	FAULT	Red LED	Lights if microcontroller CCA malfunctions or lacks proper input.
(E)	FAULT	Red LED	Lights if group multiplexer CCA malfunctions or lacks proper input.
(F)	FAULT	Red LED	Lights if timing CCA malfunctions or lacks proper input.
(G)	FAULT	Red LED	Lights if supergroup A CCA malfunctions or lacks proper input.
(H)	FAULT	Red LED	Lights if supergroup B CCA malfunctions or lacks proper input.
(I)	FAULT	Red LED	Lights if supergroup timing CCA malfunctions or lacks proper input.
(J)	FAULT	Red LED	Lights if BITE 1 CCA malfunctions or lacks proper input.
(K)	FAULT	Red LED	Lights if filter assembly malfunctions.
(L)	00F	Red LED	Lights if receive supergroup frame sync is lost.
(M)	00F	Red LED	Lights if receive group frame sync is lost.

2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued



2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

<u>Key</u>	<u>Name</u>	<u>Type</u>	<u>Function</u>
(N)	FRAME	Toggle Switch	Selects required group frame mode: Yes/No.
(P)	TMG	Toggle Switch	Selects either station clock or the received supergroup clock for supergroup transmit timing.
(Q)	CHAN RATE	Toggle Switch	Selects digital channel rate, either 32 or 16.
(R)	SG FORMAT	Thumbwheel, 8-position rotary switch	Selects required supergroup frame format.
(S)	SUP GP RATE	Thumbwheel, 13-position rotary switch	Selects required supergroup bit rate.
(T)	GP RATE	Thumbwheel, 13-position rotary switch	Selects required group bit rate.

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES**2-4. GENERAL**

To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS). The scheduled inspections allow defects to be discovered and corrected before they result in serious damage or failure.

2-5. OPERATOR PMCS TABLE

A PMCS table for the TGM is provided below. There is one category or interval of PMCS: W. It heads the INTERVAL column of the PMCS table. A dot in the INTERVAL column indicates the check and/or service that you should perform at a particular time.

2-5. OPERATOR PMCS TABLE—Continued

a. W stands for weekly. W - PMCS are important preventive maintenance checks and services you make at weekly intervals to keep serious problems from suddenly happening. You should perform W - PMCS if:

- You are the assigned operator and have not operated the item since the last W - PMCS.
- You are operating the item for the first time.

b. If your equipment fails to operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms (see DA PAM 738-750).

NOTE

Use your PMCS table Item no. column to get the number for the TM ITEM NO. column of DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when recording results of PMCS.

NOTE

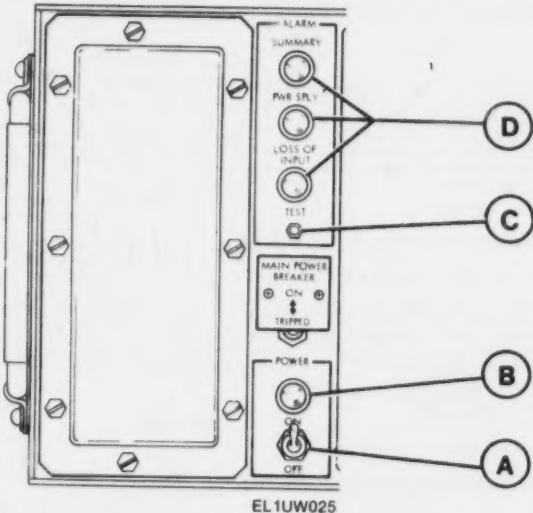
If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down or when order-wire channels are available.

c. Routine checks are not listed as PMCS checks. The following are some of the routine checks:

- Cleaning
- Washing
- Dusting
- Checking for frayed cables
- Storing items not in use
- Covering unused receptacles
- Check for loose nuts, bolts, and screws

d. You should perform routine checks as the need comes up.

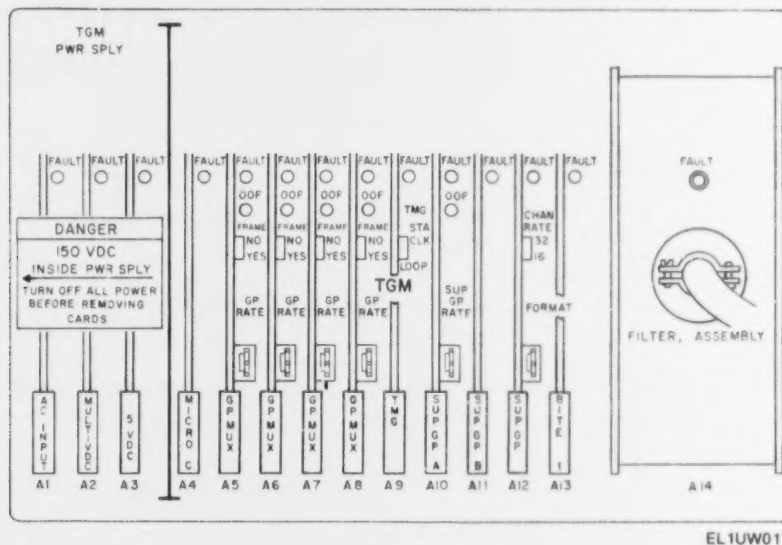
2-5. OPERATOR PMCS TABLE—Continued

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
	W			
1	•	TGM BITE Test	 EL1UW025 (A) Set POWER ON/OFF switch to ON. (B) POWER lamp lights. (C) Press ALARM TEST switch. (D) ALAPM SUMMARY, PWR SPLY, and LOSS OF INPUT lamps light.	POWER lamp does not light. ALARM SUMMARY PWR SPLY, and LOSS OF INPUT lamps do not light or if lamps stay on after button is released.

Section III. OPERATION UNDER USUAL CONDITIONS

2-6. RESETTING CCA SWITCHES

After initial installation and operation of the TGM, changes in system use may require resetting switches on the TGM. If CCA switches must be reset, refer to the following table for switch setting data. Changes of system use will be directed by personnel at the system control point. Refer to label on front cover. See paragraph 4-14 for cover removal.



EL1UW017

Switch Name

Function

FRAME

Selects required frame mode YES or NO for each signal (Group 2, 3, or 4) by setting the switch on GP MUX CCA (A6) (Group 2), GP MUX CCA (A7) (Group 3), and GP MUX CCA (A8) (Group 4) as follows:

Position

Setting Data

YES

Set to this position when group signal has system-compatible frame pulse.

NO

Set to this position when group signal does not have system-compatible frame pulse.

NOTE

FRAME switch on GP MUX CCA (A5) (Group 1) must always be set to YES position.

2-6. RESETTNG CCA SWITCHES—ContinuedSwitch NameFunction

TMG

Selects required clock source for supergroup transmit traffic timing as follows:

PositionSetting Data

STA CLK

Set to this position when station clock is to be used for transmit timing.

LOOP

Set to this position when the receive supergroup timing is to be used for transmit timing.

CHAN RATE

Selects required channel rate for digital group channel rate use.

PositionSetting Data

32

Set to this position when 32 kb/s channels are used.

16

Set to this position when 16 kb/s channels are used.

FORMAT

Selects required receive supergroup frame format. Determine desired frame format and set switch to matching position.

PositionFrame FormatGroup Ratio

0

C

4:2:1:1

1

B

2:1:1

2

A3

1:1:1:1

3

A1

1:1

4

A2

1:1:1

5

D1

4 RLGM

6

D2

2 RLGM

7

SG

Single Group

2-6. RESETTING CCA SWITCHES—Continued

<u>Switch Name</u>	<u>Function</u>
SUP GP RATE	Selects supergroup receive traffic bit rate. Determine desired bit rate and set switch to matching position.

<u>Position</u>	<u>Bit Rate (kb/s)</u>
2	128
3	144
4	256
5	288
6	512
7	576
8	1024
9	1152
10	1536
11	2048
12	2304
13	4096
14	4608

NOTE

Positions 0, 1, and 15 cannot be selected.

GP RATE	Selects required group transmit/receive traffic bit rate. Determine desired bit rate and set switch to matching position.
---------	---

<u>Position</u>	<u>Bit Rate (kb/s)</u>
0	OFF (Use this position when group is not used)
1	72
2	128
3	144
4	256
5	288
6	512
7	576
8	1024
9	1152
10	NOT USED
11	2048
12	2304

NOTE

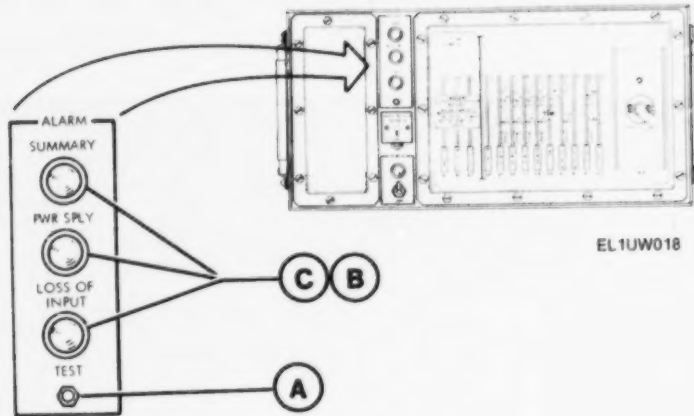
Positions 13, 14, and 15 cannot be selected.



- 2-16

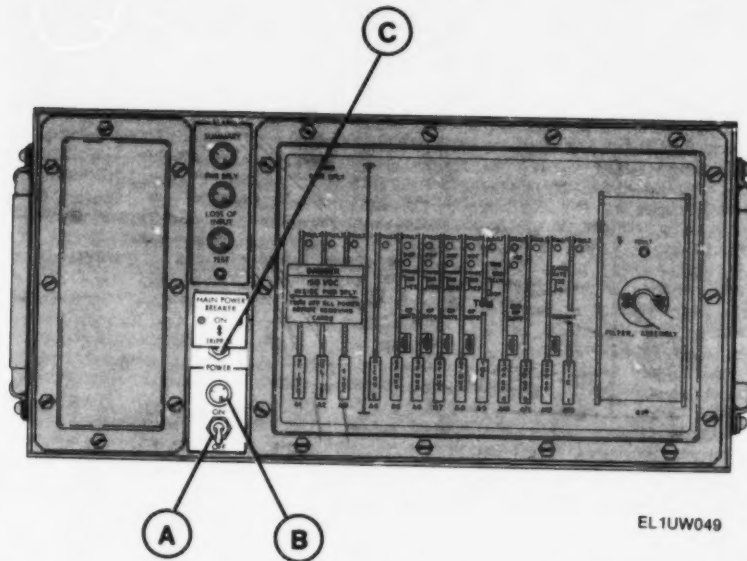
2-8. OPERATOR CHECKS

The only operator check required is a BITE test. The system must be operating.



- (A) Press TEST pushbutton.
- (B) Lamps should light.
- (C) If any lamp fails to light, refer to organizational level maintenance.

2-9. EQUIPMENT TURNOFF



- (A) Set POWER ON/OFF switch to OFF.
- (B) POWER lamp goes off.
- (C) Leave MAIN POWER BREAKER ON.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-10. OPERATING IN UNUSUAL WEATHER

Although intended for use inside a heated/air-conditioned shelter, the TGM will operate in the following environments:

a. Arctic Climate.

- The TGM operates at temperatures down to -25°F (-32°C) and can be stored at temperatures down to -70°F (-57°C).
- Extreme cold causes components, especially cables and plastic components, to become brittle. Permanent damage can result from mechanical shock to components. Cables can break if kinked or bent.
- When cold equipment is brought into a warm room, moisture will condense on its surfaces. Before operation, allow equipment to warm to room temperature, then dry thoroughly with cloth.

b. Tropical Climate.

- The TGM operates at temperatures as high as +145°F (+63°C) and can be stored at temperatures as high as +160°F (+71°C).
- Extreme heat and humidity can cause moisture and fungus growth which can cause improper operation. Keep cover on as much as possible and ventilate the equipment as often as possible.

c. Desert Climate.

- The TGM operates at temperatures up to +145°F (+63°C) and can be stored at temperatures up to +160°F (+71°C).
- Wind-blown sand, dirt, or dust will damage the equipment. Keep cover on as much as possible.

d. Salt Air.

- Salt air can corrode the connectors and controls on the TGM. Keep cover on as much as possible and clean surfaces with damp cloth (fresh water).

2-10. OPERATING IN UNUSUAL WEATHER—Continued

e. High Altitudes.

- The TGM can operate at altitudes up to 10,000 feet and can be stored at altitudes up to 40,000 feet.

2-11. ELECTRICAL INTERFERENCE

Observe the following guidelines to minimize electrical interference caused by external sources:

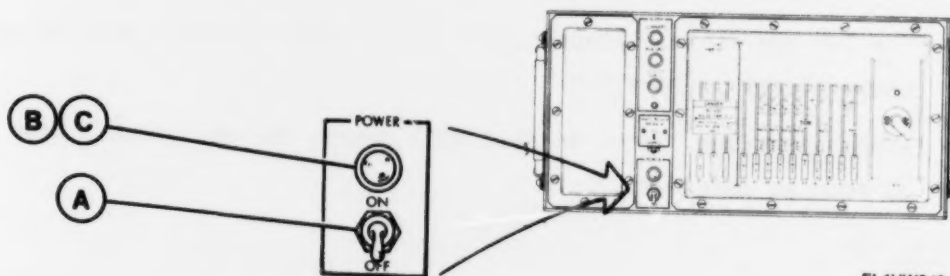
- a. Keep ground connections secure.
- b. Keep cable connections secure.
- c. Keep captive screws on the CCA covers secure.

2-12. EMERGENCY PROCEDURES

NOTE

Any shelter or facility circuit breaker controlling power to the TGM may control power to other equipment. Assume that the emergency warrants turning off the other equipment before operating this circuit breaker.

- a. Emergency Turn Off. There are no special emergency turn off procedures. In an emergency, perform the following:

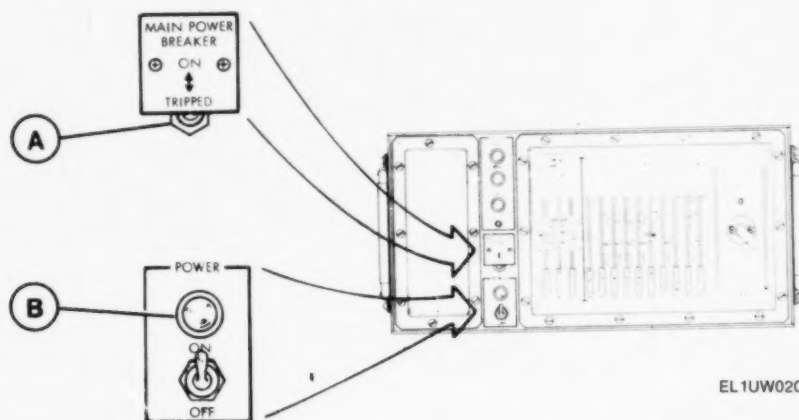


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2-12. EMERGENCY PROCEDURES—Continued

- (A) Quickly set POWER ON/OFF switch to OFF.
- (B) POWER indicator lamp should go out.
- (C) If POWER indicator fails to go out, trip external circuit breaker supplying facility power to the TGM.

b. Power Transients. If power to the TGM varies widely, MAIN POWER BREAKER may trip. If this occurs:



- (A) Set MAIN POWER BREAKER to ON.
- (B) POWER indicator lamp should light.

CHAPTER 3

OPERATOR MAINTENANCE

For the purpose of this manual, crew and operator maintenance are one and the same.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

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**Section I. REPAIR PARTS; SPECIAL TOOLS; TEST,
MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE);
AND SUPPORT EQUIPMENT**

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. For Air Force, refer to appropriate Table of Allowances.

4.2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

For Repair Parts and Special Tools List (RPSTL), refer to TM 11-5805-697-24P (Army) or TO 31W2-2G-354 (USAF).

Maintenance tools and equipment as authorized by the Maintenance Allocation Chart (refer to Appendix B, MAC) for organizational maintenance are as follows:

Tool Kit, Electronic Equipment TK-101/G, 1 each

4-3. REPAIR PARTS

Repair parts are listed and illustrated in the RPSTL (TM 11-5805-697-24P) covering operator and organizational maintenance for the TGM. For Air Force, refer to TO 31W2-2G-354.

Section II. SERVICE UPON RECEIPT

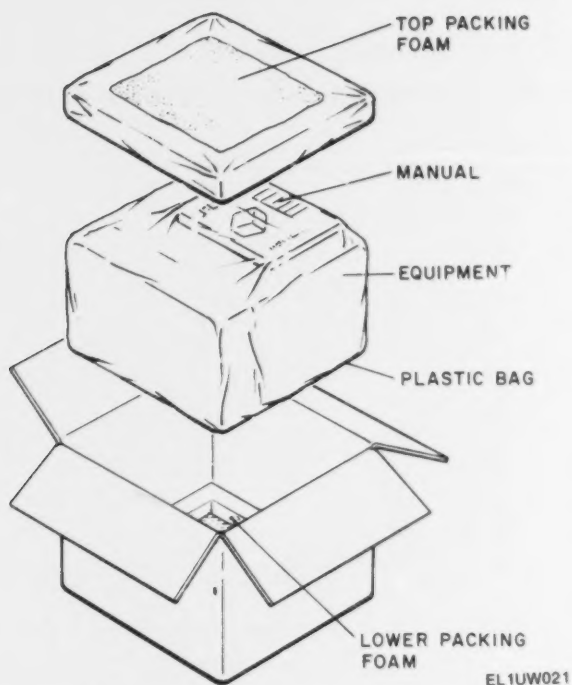
WARNING



HEAVY EQUIPMENT

This equipment weighs over 35 pounds and can cause serious injury if lifted or carried alone. Do not attempt to lift, carry, or move the equipment by yourself -- use at least two persons.

4-4. UNPACKING



a. Open.

- Use sharp knife to cut reinforcing tape on top of carton.
- Open top of box.

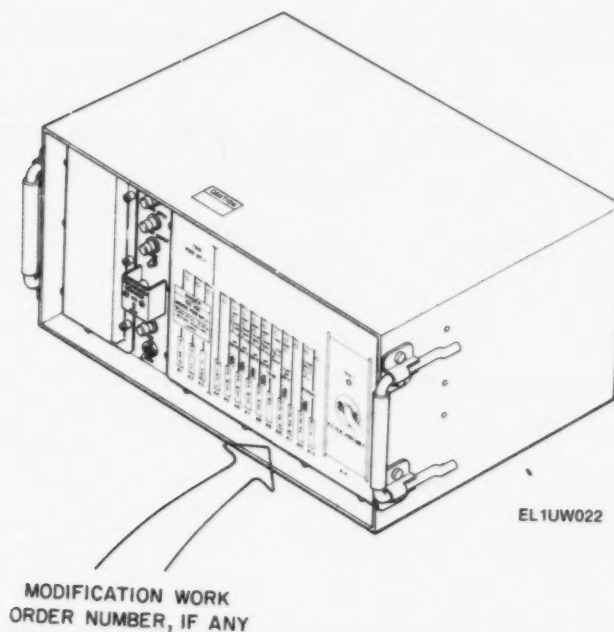
b. Remove TGM.

- Lift out top packing.
- Lift out equipment including manual.
- Use sharp knife to slit plastic bag.
- Remove manual and equipment with bag of hardware attached.

4-5. CHECKING UNPACKED EQUIPMENT

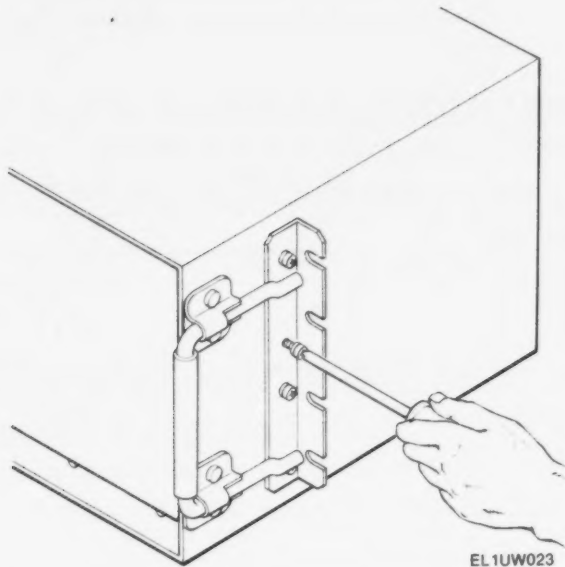
a. Damage. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on SF 364 (Report of Discrepancy (ROD)). For Air Force, use DD Form 173 (Material Deficiency Report (Category 1)).

b. Packing Slip. Check equipment against the packing slip to see if shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750.



c. Modifications. Check DA Pam 310-1, Consolidated Index of Army Publications and Blank Forms, for Modification Work Orders (MWO) applicable to this equipment. Compare MWO number (if any) obtained from DA Pam 310-1 with that on equipment. If numbers disagree, equipment must be modified.

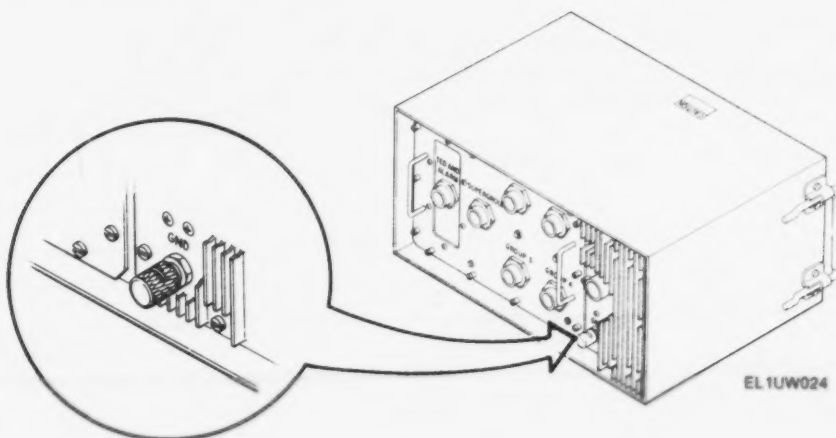
4-6. INSTALLATION OF MOUNTING BRACKETS



- a. Remove mounting brackets and attaching hardware from bag.
- b. Install one mounting bracket to each side of equipment case using No. 2 Phillips screwdriver, four screws, and four flat washers.

4-7. GROUNDING

A ground wire should be attached to ground lug on rear of TGM, and remain in place while equipment is installed.



Section III. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-8. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS). When you are doing any PMCS or routine checks, keep in mind WARNINGS and CAUTIONS about electrical shock and bodily harm.

4-9. PMCS TABLE

A PMCS table for Multiplexer TD-1236/G appears at the end of this section. There is one category or interval of PMCS: B. It heads the INTERVAL column of the PMCS table. A dot in the INTERVAL column indicates the check and/or service that should be performed by organizational maintenance personnel at a particular time.

a. B stands for before. B - PMCS should be performed before operation to make sure your equipment is ready to go.

NOTE

Use your PMCS table to get the number for the TM ITEM NO. column of DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

NOTE

If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down or when orderwire channels are available.

DA FORM 2404, EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET.

DA FORM 2404
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4-9. PMCS TABLE—Continued

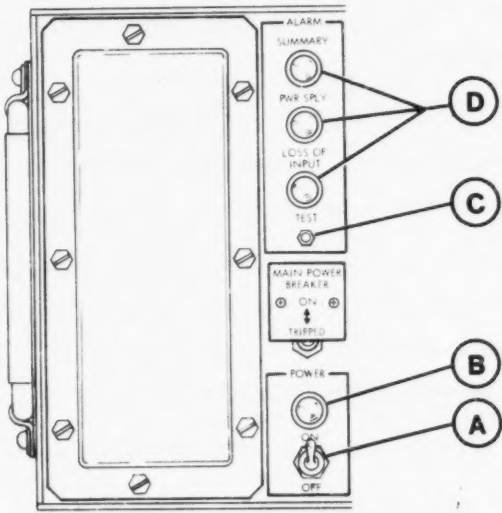
b. Whenever an equipment is reinstalled after removal for any reason, perform the necessary PMCS.

c. Routine checks are not listed as PMCS checks. The following are some of the routine checks:

- Checking for frayed cables
- Storing items not in use
- Covering unused receptacles
- Checking for loose nuts, bolts, and screws
- Cleaning
- Dusting
- Washing

d. You should perform routine checks as the need comes up.

4-9. PMCS TABLE—Continued

ITEM NO.	INTERVAL	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY.
	B		
1	•	POWER ON	 EL1UW025 A Set POWER ON/OFF switch to ON. B POWER lamp lights C Press ALARM TEST switch. D ALARM (SUMMARY, PWR SPLY, and LOSS OF INPUT) lamps light
2	•	BITE Test	

Section IV. TROUBLESHOOTING

4-10. TROUBLESHOOTING PROCEDURE

Troubleshooting the TGM is normally initiated by the maintenance supervisor system control point. A probable malfunction in the TGM is identified by the system control point personnel, who interpret equipment fault alarm indicators on the system status console. Upon diagnosing a probable fault to the TGM, the system control point so notifies the organization, which then uses the flowcharts to locate the fault.

The flowchart information is based on visual symptoms obtained from the TGM BITE lamps. Before troubleshooting, check that all CCA switches are set as directed by the system control point.

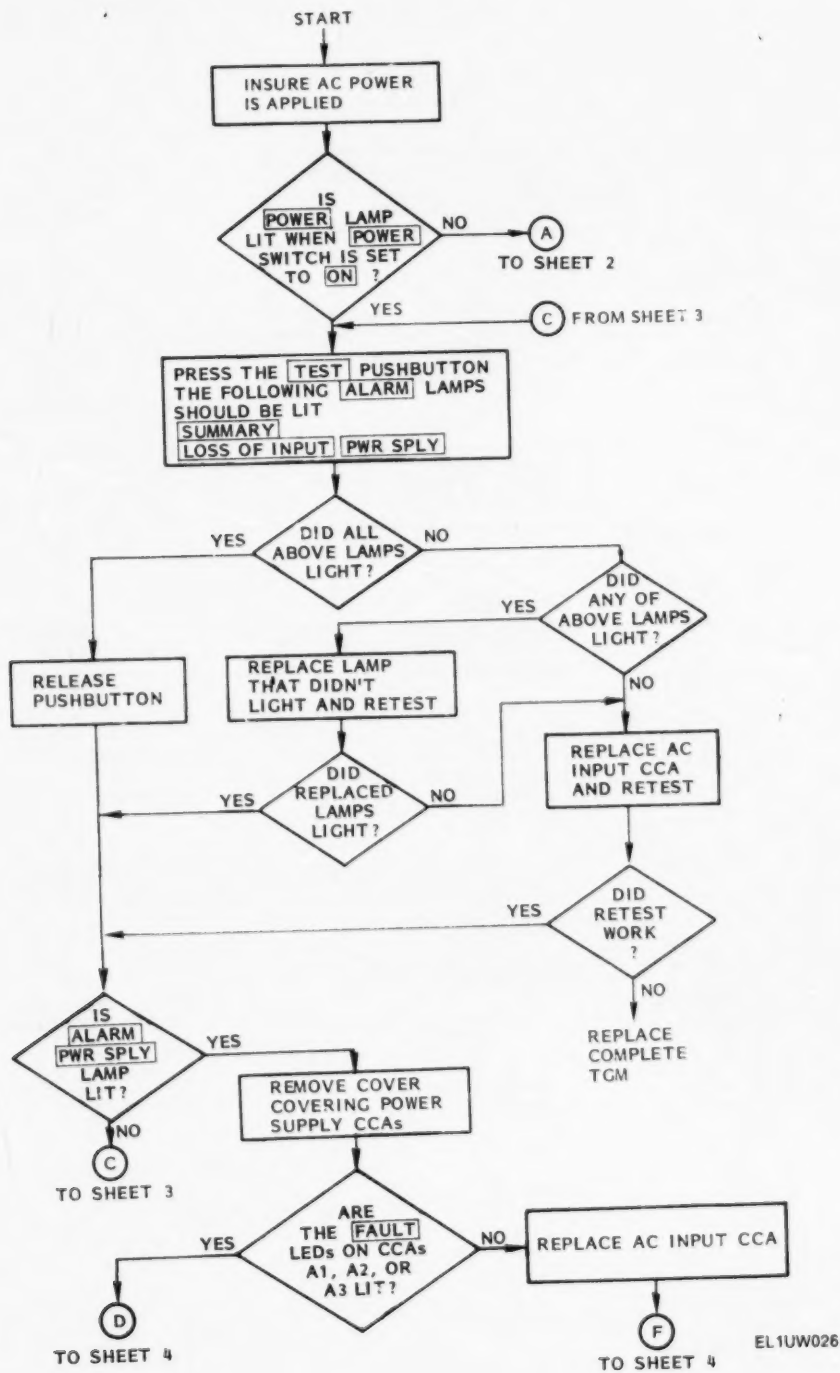
The flowchart is a step-by-step path through the TGM. All decisions are made in the diamond shaped ($\diamond$) boxes and require a yes or no answer. All instructions are given in the rectangular shaped boxes ($\square$) and must be accomplished before moving on with the procedure. When the word END is reached, the fault should be corrected.

When replacing a CCA that has settable switches:

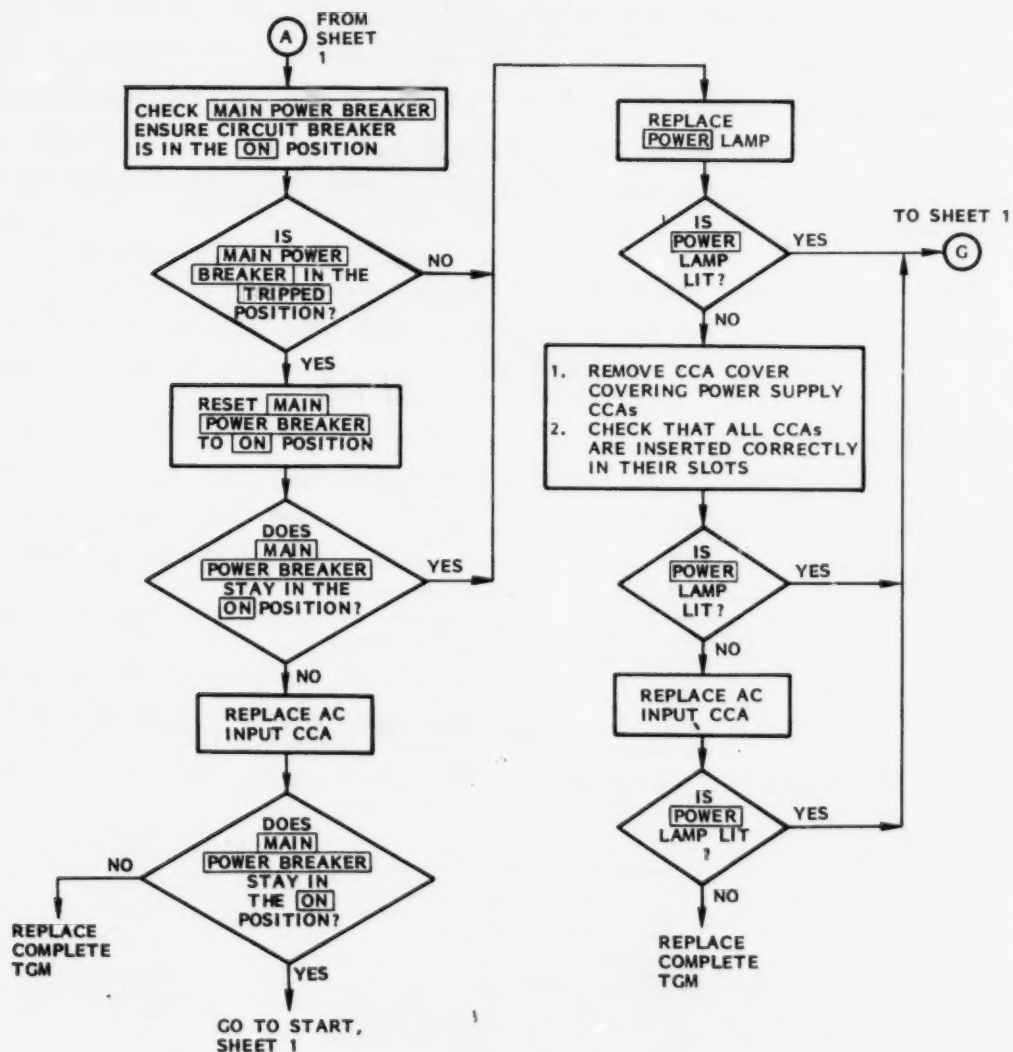
- Note positions of switches on old CCA.
- Set switches on new CCA in same positions.

If faults occur during system setup, check that all switches are properly set.

4-11. TROUBLESHOOTING FLOWCHART—Sheet 1 of 6



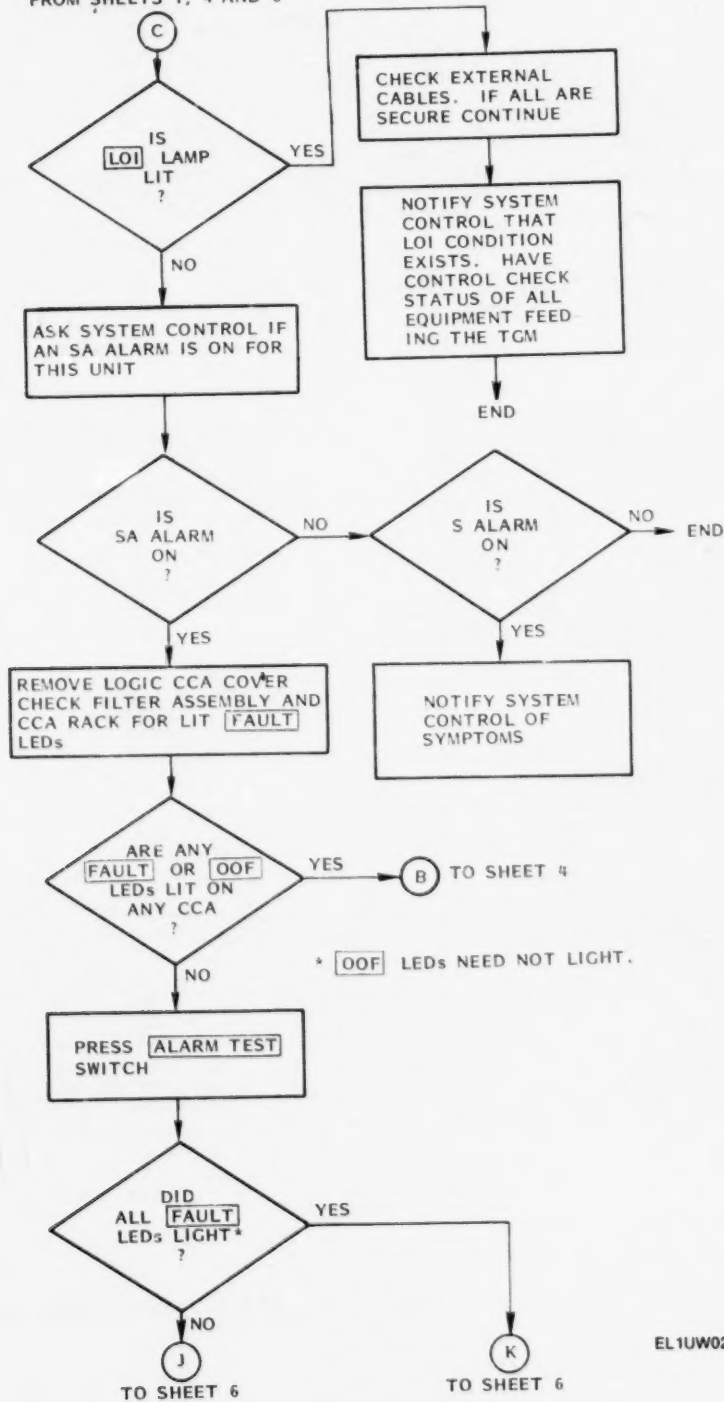
4-11. TROUBLESHOOTING FLOWCHART—Sheet 2 of 6



EL1UW027

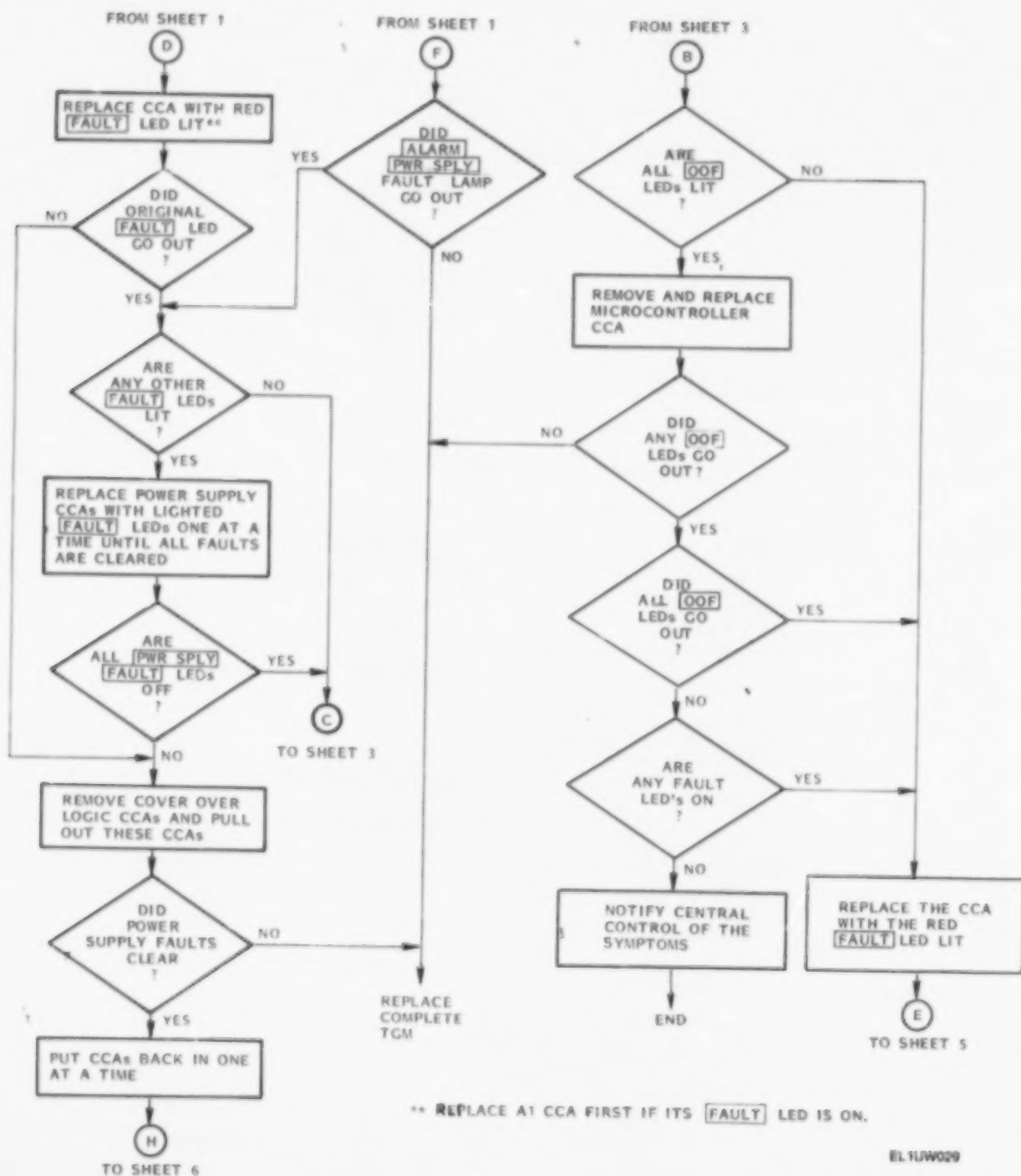
4-11. TROUBLESHOOTING FLOWCHART—Sheet 3 of 6

FROM SHEETS 1, 4 AND 6

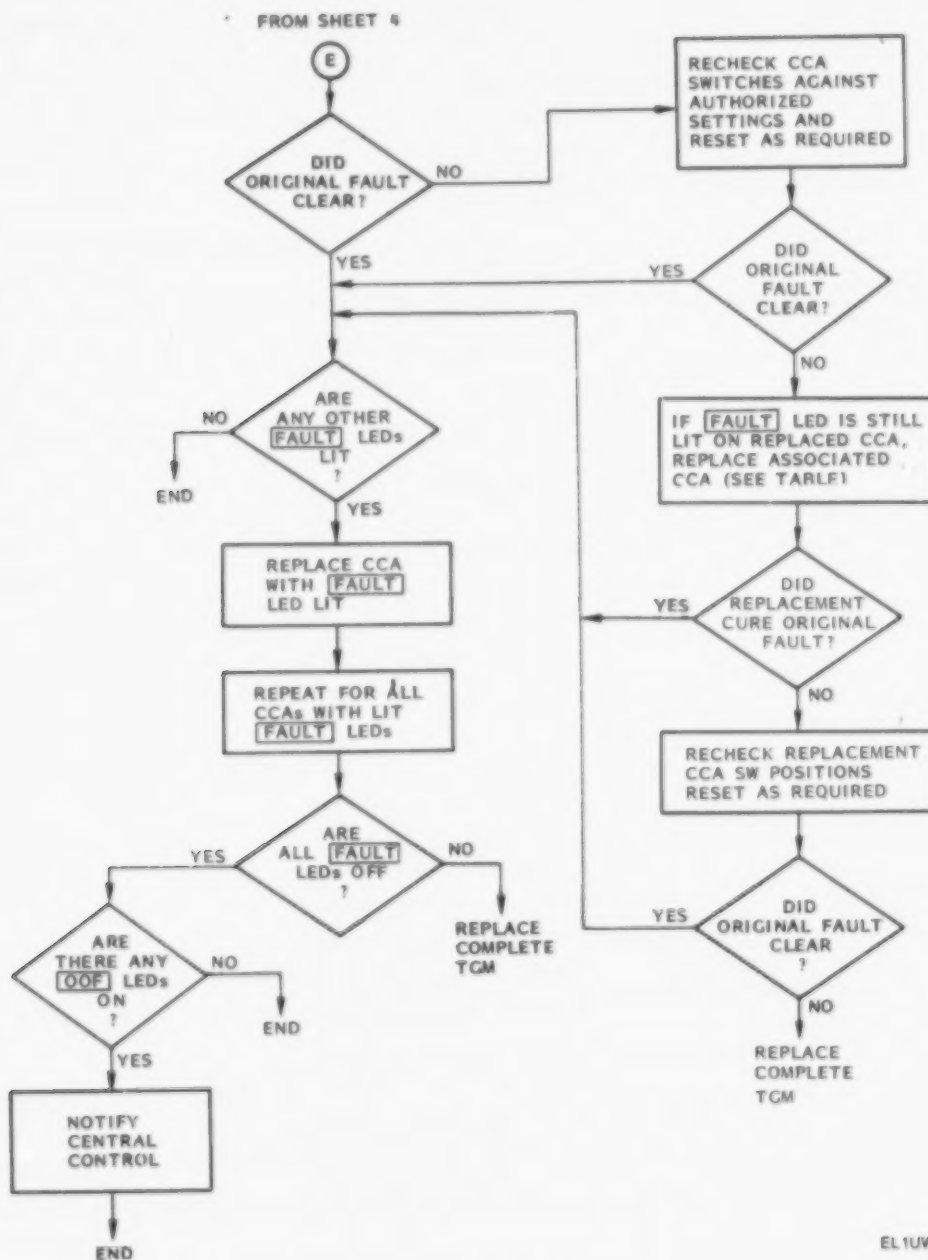


EL1UW028

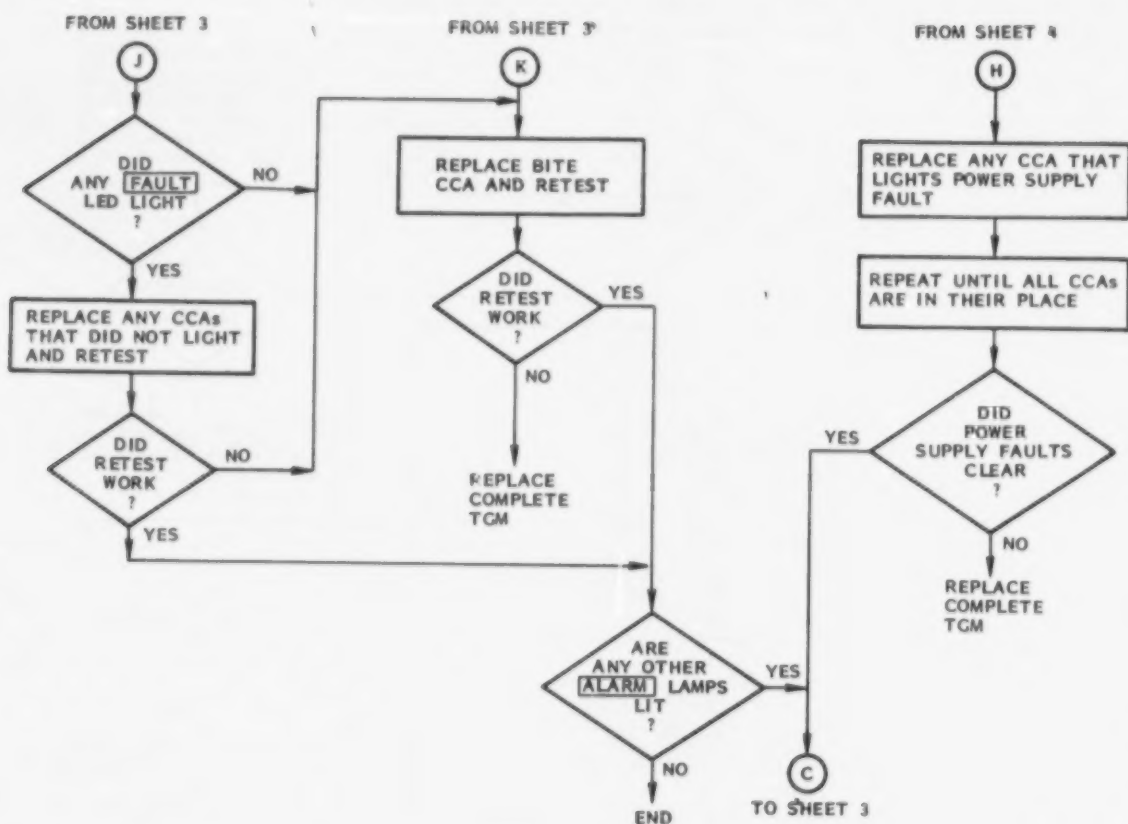
4-11. TROUBLESHOOTING FLOWCHART—Sheet 4 of 6



4-11. TROUBLESHOOTING FLOWCHART—Sheet 5 of 6



4-11. TROUBLESHOOTING FLOWCHART—Sheet 6 of 6



TABLE

CCA REPLACED	ASSOCIATED CCA
SUPERCROUP TIMING	SUPERCROUP A, BITE 1
SUPERCROUP A	SUPERCROUP TIMING, MICROCONTROLLER, BITE 1
MUX/DEMUX	SUPERCROUP TIMING, MICROCONTROLLER, BITE 1
SUPERCROUP B	MUX/DEMUX, TIMING, SUPERCROUP A, BITE 1
TIMING	MUX/DEMUX, BITE 1, MICROCONTROLLER

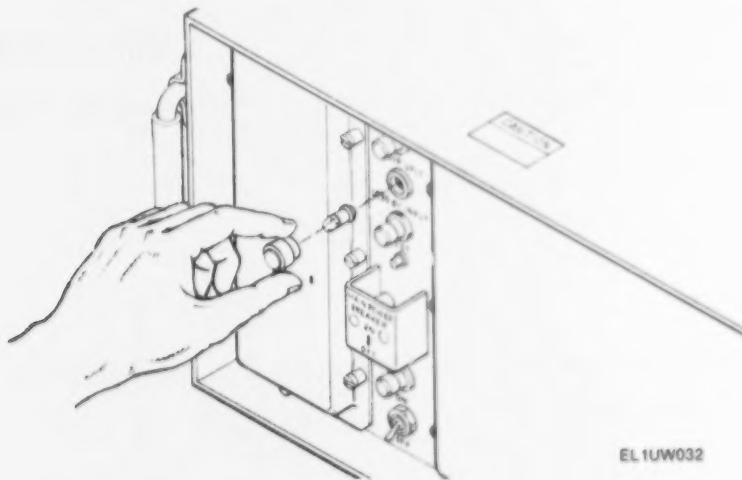
EL1UW031

Section V. MAINTENANCE PROCEDURES**4-12. ORGANIZATIONAL MAINTENANCE**

Organizational corrective maintenance of the TGM consists of removing and replacing those items found to be defective during troubleshooting. These procedures are limited to removal and replacement of lamp bulbs, cover assemblies, circuit card assemblies, and filter assembly.

4-13. REMOVAL AND REPLACEMENT OF LAMPS

Only the lamps for the SUMMARY, PWR SPLY, LOSS OF INPUT, and POWER lights are replaceable at the organizational maintenance level.

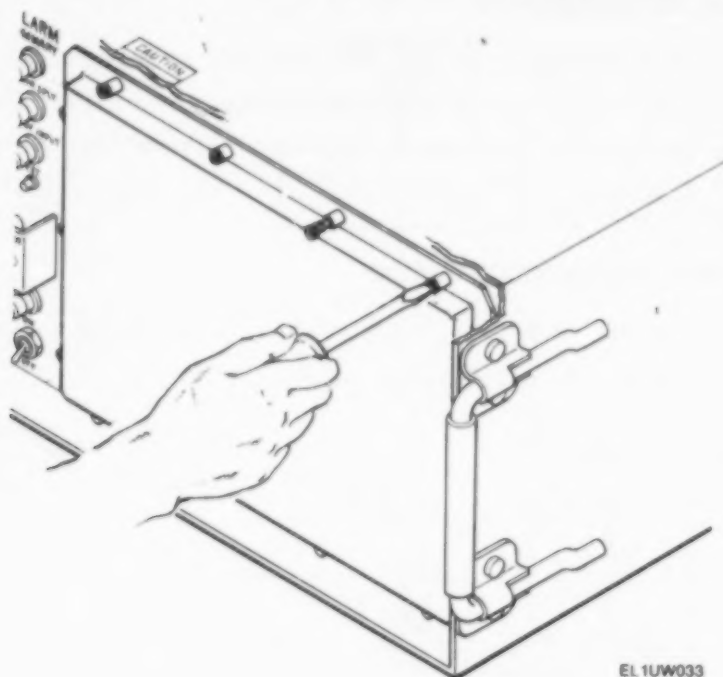
**REMOVAL**

- 1 Turn lens assembly counterclockwise and remove.
- 2 Pull lamp loose from lens assembly and remove.

REPLACEMENT

- 1 Press new lamp into lens assembly.
- 2 Reinstall lens assembly and turn clockwise to secure.

4-14. REMOVAL AND REPLACEMENT OF LOGIC CCA COMPARTMENT COVER ASSEMBLY



REMOVAL

- Using flat blade screwdriver, loosen 14 captive screws securing CCA cover assembly and remove cover.

REPLACEMENT

- Install CCA cover assembly and secure 14 captive screws using flat blade screwdriver. Do not overtighten.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs

CAUTION



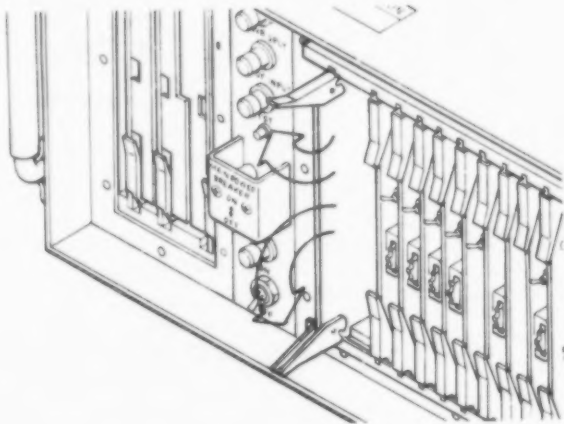
Static discharge can damage microcircuit components on CCAs. To avoid this damage, observe the following:

- (1) Handle CCAs by their edges only.
- (2) Do not wrap, store, or ship CCAs in plastic bags; use containers made of heavy paper or aluminum foil.
- (3) Do not rub CCAs against clothing or wipe with a cloth made with synthetic fibers (plastic, acrylic, nylon, etc.).

PRELIMINARY PROCEDURES

- Remove logic CCA compartment cover in accordance with paragraph 4-14.

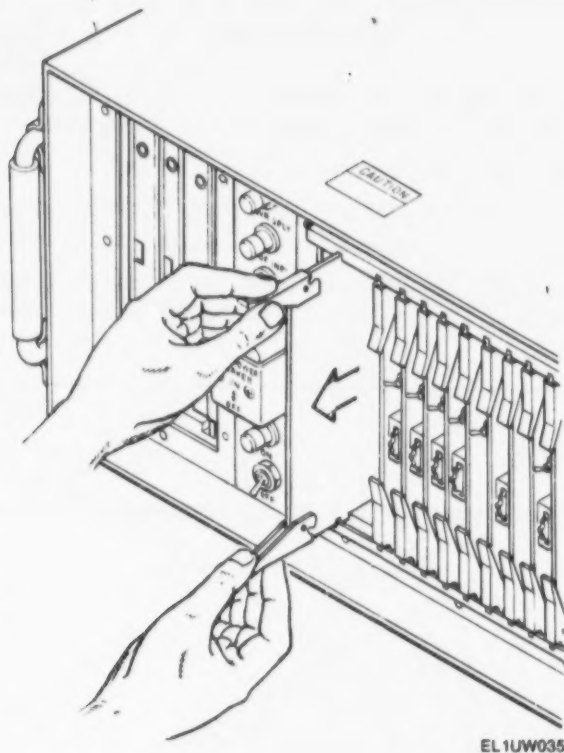
REMOVAL



EL1UW034

- 1 Swing out both levers on card at the same time to disengage card from connector.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued



- 2 Carefully pull out card.
- 3 Note positions of any CCA switches.
- 4 Set any switches on replacement CCA to positions noted on removed CCA.

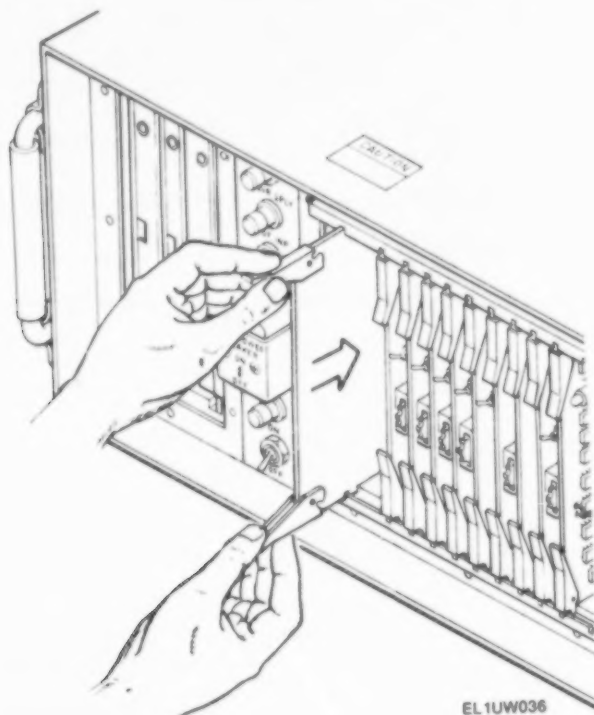
4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued

REPLACEMENT

CAUTION

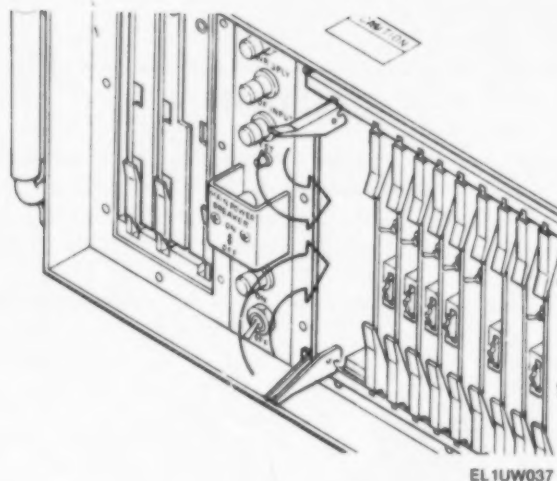


Damage will result if excessive force is used to insert cards. If cards cannot be inserted with reasonable force, ensure card identification on card extractor matches that on slot. Ensure that levers are straight out before insertion.



- 1 Aline card in slot and carefully push in. As card begins to engage, levers will begin to move in.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued



- 2 When card is properly in place, swing in both levers at the same time to engage card in connector.
- 3 Replace logic CCA compartment cover in accordance with paragraph 4-14.

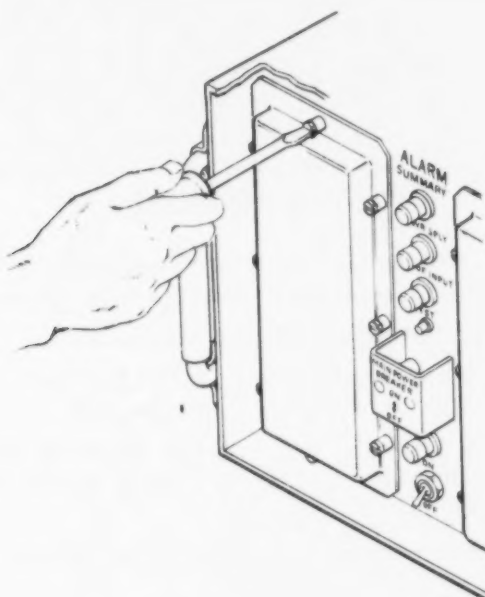
4-16. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCA COMPARTMENT COVER ASSEMBLY

WARNING



HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Ground the equipment. Avoid the 115-volt ac input. Do not service alone. Where possible, use one hand to service.



EL1UW038

REMOVAL

- Using a flat blade screwdriver, loosen eight captive screws securing CCA cover assembly and remove cover.

REPLACEMENT

- Install CCA cover assembly and secure eight captive screws. Do not overtighten.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs

WARNING



HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Ground the equipment. Avoid the 115-volt ac input. Do not service alone. Where possible, use one hand to service.

CAUTION



Static discharge can damage microcircuit components on CCAs. To avoid this damage, observe the following:

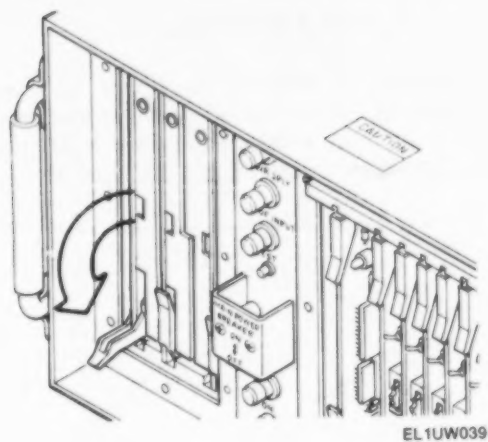
- (1) Handle CCAs by their edges only.
- (2) Do not wrap, store, or ship CCAs in plastic bags; use containers made of heavy paper or aluminum foil.
- (3) Do not rub CCAs against clothing or wipe with a cloth made with synthetic fibers (plastic, acrylic, nylon, etc.).

PRELIMINARY PROCEDURES

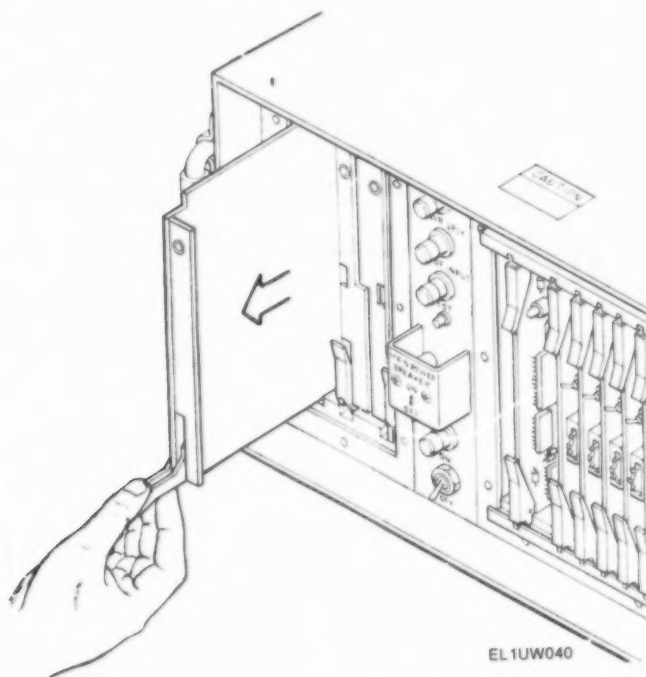
- Set front panel POWER ON/OFF switch to OFF.
- Remove power supply CCA compartment cover in accordance with paragraph 4-16.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued

REMOVAL



1 Swing out lever on bottom of card.



2 Carefully pull out card.

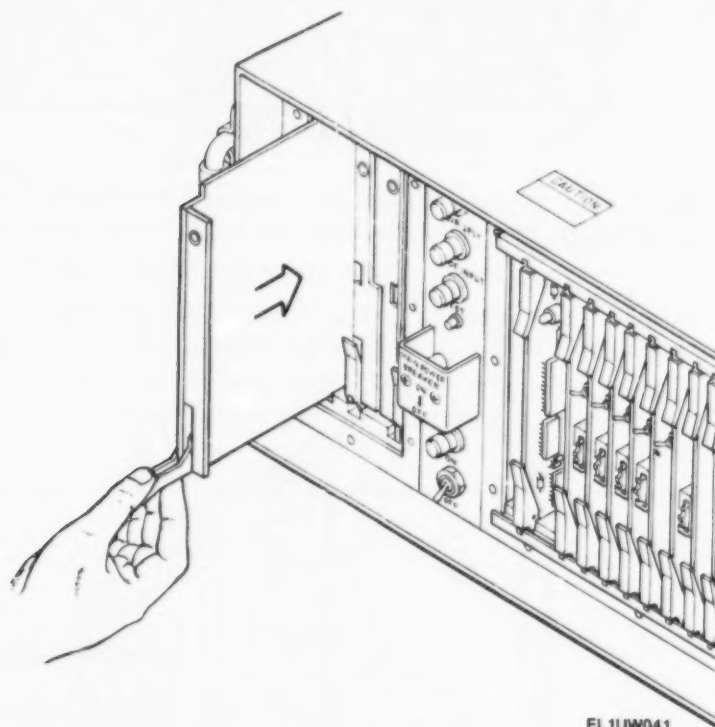
4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued

REPLACEMENT

CAUTION



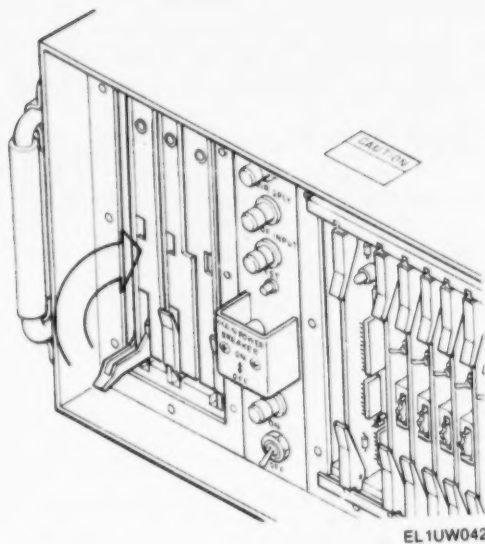
Damage will result if excessive force is used to insert cards. If cards cannot be inserted with reasonable force, ensure card identification on red anodized frame matches that on slot. Ensure that Levers are straight out before insertion.



EL 1UW041

1. Align card in slot and carefully push in.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued



- 2 Ensure that card is properly seated, then swing in lever.
- 3 Replace power supply CCA compartment cover in accordance with paragraph 4-15.
- 4 Set front panel POWER ON/OFF switch to ON.

4-18. REMOVAL AND REPLACEMENT OF FILTER ASSEMBLY

REMOVAL

NOTE

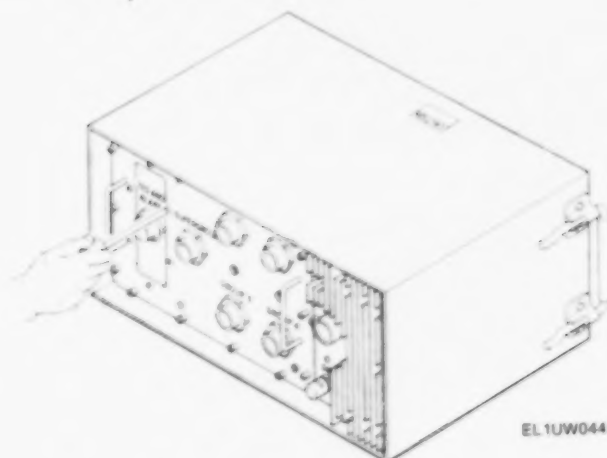
If TGM must be removed from installed location, note locations of connecting cables.

- 1 Set front panel POWER ON/OFF switch to OFF.
- 2 Remove logic CCA compartment cover in accordance with paragraph 4-14.



- 3 At the front of the TGM, disconnect cable connector from filter assembly.
- 4 At rear of TGM, tag and remove connector that is attached to the TED and ALARM jack.

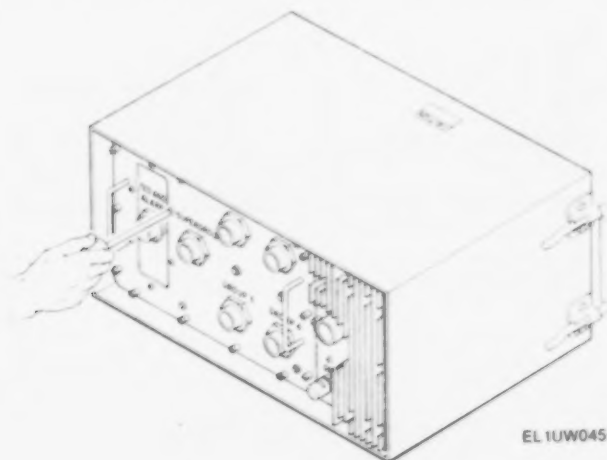
4-18. REMOVAL AND REPLACEMENT OF FILTER ASSEMBLY — Continued



- 5 At rear of the TGM, using No. 2 4-inch Phillips screwdriver, remove the Phillips-head screws securing the filter assembly to rear panel.
- 6 Slide the filter assembly out the front of the TGM.

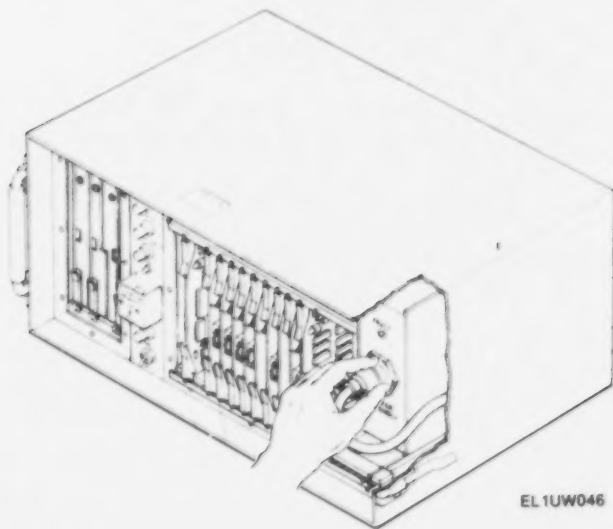
REPLACEMENT

- 1 At front of TGM, slide replacement filter assembly into appropriate CCA slot.

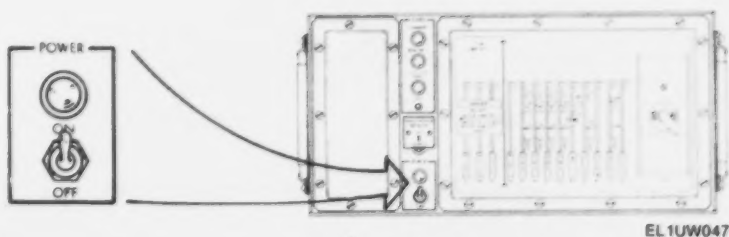


- 2 Secure filter assembly at rear of TGM using previously removed Phillips-head screws.

4-18. REMOVAL AND REPLACEMENT OF FILTER ASSEMBLY — Continued



- 3 Reconnect cables at front and rear of filter assembly.
- 4 At front of TGM, replace logic CCA compartment cover in accordance with paragraph 4-14.



- 5 Set front panel POWER ON/OFF switch to ON.

APPENDIX A REFERENCES

A-1. SCOPE

This appendix lists all forms, technical publications, and miscellaneous publications referenced in the manual.

A-2. FORMS

Technical Order System Publication Improvement Report and Reply	AFTO Form 22
Recommended Changes to Publications and Blank Forms	DA Form 2028
Recommended Changes to Equipment Technical Publications ...	DA Form 2028-2
Equipment Inspection and Maintenance Worksheet	DA Form 2404
Discrepancy in Shipment Report (DISREP)	SF 361
Report of Discrepancy (ROD)	SF 364
Material Deficiency Report (Category 1)	DA Form 173
Quality Deficiency Report (Category 2)	SF 368

A-3. TECHNICAL MANUALS

Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command)	TM 750-244-2
Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-1236/G (NSN 5820-01-145-2461)	TM 11-5085-697-24P

A-4. REGULATIONS

Report of Transportation Discrepancies in Shipments	AR 55-38
Reporting of Item and Packaging Discrepancies	AR 735-11-2

A-5. MISCELLANEOUS PUBLICATIONS

Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)	CTA 50-970
Consolidated Index of Army Publications and Blank Forms ...	DA Pam 310-1
The Army Maintenance Management System (TAMMS)	DA Pam 738-750
Federal Supply Code for Manufacturers (FSCM)	SB 708-41/42

APPENDIX B

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

e. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

B-2. MAINTENANCE FUNCTIONS—Continued

f. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow proper functioning of an equipment or system.

g. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position code of the SMR code.

h. Repair. The application of maintenance services including fault location/troubleshooting removal/installation and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, sub-assembly, module (component or assembly), end item, or system.

i. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

j. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

a. Column 1, Group Number. This column lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. Column 2, Component/Assembly. This column contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. This column lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Category. This column specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II—Continued

figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C Operator or Crew
 O Organizational Maintenance
 F Direct Support Maintenance
 H General Support Maintenance
 D Depot Maintenance

e. Column 5, Tools and Equipment. This column specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

a. Column 1, Reference Code. The tool and test equipment code correlates with a code used in the MAC, Section II, column 5.

b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National Stock Number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

a. Column 1, Reference Code. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR MULTIPLEXER TD-1236/G

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY					TOOLS AND TE	REMARKS
			C	O	F	H	D		
00	MULTIPLEXER TD-1236/G (PN SM-D-875929)	INSPECT		1.20				10	A
		SERVICE		0.10				10	B
		REPAIR		2.30				09, 10	C
		INSPECT			0.70			11	A
		TEST			4.00			03, 05, 11, 14,	D
								30, 31, 32, 33	
		REPAIR			2.60			03, 05, 11, 14,	E
								30, 31, 32, 33	
		INSPECT				0.90		11	A
		TEST				2.90		02, 03, 04, 05,	H
01	AC INPUT CCA (PN SM-D-884579)	REPAIR					19.40	06, 11	
								02, 03, 04, 05,	G
		OVERHAUL					37.50	06, 11	
								02, 03, 04, 05,	F
								06, 07, 08, 09,	
02	MULTI VDC CCA (PN SM-D-884567)	INSPECT		0.10				11, 19, 20, 47	
		REPLACE		0.20				10	OT1
		INSPECT				0.10		10	OT2
		TEST				0.30		--	HT1
		REPAIR				1.20		02, 03, 05	HT3
03	5 VDC CCA (PN SM-D-384593)							02, 03, 05, 06,	HT2
		INSPECT		0.10				11	
		REPLACE		0.20				10	OT1
		INSPECT				0.10		10	OT2
		TEST				0.30		--	HT1
04		REPAIR				1.20		02, 03, 05	HT3
								02, 03, 05, 06,	HT2
								11	
								10	OT1
								10	OT2
05		INSPECT				0.10		--	HT1
		REPLACE				0.30		02, 03, 05	HT3
		INSPECT				1.20		02, 03, 05, 06,	HT2
		TEST						11	
		REPAIR						10	OT1

Section II. MAINTENANCE ALLOCATION CHART—Continued

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY					TOOLS AND TE	REMARKS
			C	O	F	H	D		
04	MICROCONTROLLER CCA (PN SM-D-875945)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.40		03, 04, 05	HT3
		REPAIR				3.70		03, 04, 05, 06, 11	HT2
05	GROUP MUX/DEMUX CCA (PN SM-D-884544)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.30		03, 04, 05	HT3
		REPAIR				2.10		03, 04, 05, 06, 11	HT2
06	TIMING CCA (PN SM-D-875942)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.30		02, 03, 05	HT3
		REPAIR				2.10		02, 03, 05, 06, 11	HT2
07	SUPERGROUP A CCA (PN SM-D-875944)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.30		03, 04, 05	HT3
		REPAIR				2.10		03, 04, 05, 06, 11	HT2
08	SUPERGROUP R CCA (PN SM-D-875269)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT					0.10	--	DT1
		TEST					0.30	03, 04, 05	DT5
		REPAIR					2.10	03, 04, 05, 06, 11	DT4
09	SUPERGROUP TIMING CCA (PN SM-D-876006)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.30		03, 04, 05	HT3
		REPAIR				2.10		03, 04, 05, 06, 11	HT2
10	BITE 1 CCA (PN SM-D-875948)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	HT1
		TEST				0.40		03, 04, 05	HT3
		REPAIR				3.70		03, 04, 05, 06, 11	HT2

Section II. MAINTENANCE ALLOCATION CHART—Continued

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY					TOOLS AND TE	REMARKS
			C	O	F	H	D		
11	FILTER ASSEMBLY (PN SM-D-884528)	INSPECT REPLACE INSPECT TEST REPAIR		0.10 0.30				10 10 -- 0.20 0.60 3.20 11	DT1 DT2 DT1 DT2 DT3
1101	FILTER CCA (PN SM-D-884524)	INSPECT TEST REPAIR					0.10 0.30 2.20 11	02, 03, 05 02, 03, 05, 06,	DT1 DT5 DT4
12	CASE ASSEMBLY ELECTRICAL EQPT. (PN SM-D-875940)	INSPECT TEST REPAIR INSPECT TEST REPAIR			0.60 1.00 2.60		11 03, 09, 11 03, 11 11 1.80 4.60 11	03, 06, 07, 08,	FT1 FT2 FT3 DT1 DT2 DT3
1201	ELECTRONIC COMPONENTS ASSEMBLY (PN SM-D-884378)	INSPECT INSPECT REPAIR TEST			0.10		11 0.10 0.70 0.20	11 03, 06, 08, 11 03, 11	FT1 DT1 DT3 DT2
1202	CONNECTOR ASSEMBLY, REAR (PN SM-D-875946)	INSPECT TEST REPAIR REPLACE INSPECT TEST REPAIR			0.10 0.30 0.80 0.40		11 03, 09, 11 03, 11 11 0.10 0.30 0.80	11 03, 06, 08, 11	FT1 FT2 FT3 FT4 DT1 DT2 DT3
1203	CONNECTOR ASSEMBLY, ELECTRICAL (PN SM-D-876351)	INSPECT INSPECT REPAIR TEST			0.10		11 0.10 0.60 11 0.30	11 03, 06, 08, 07, 03, 11	FT1 DT1 DT3 DT2
1204	CONNECTOR ASSEMBLY, POWER SUPPLY (PN SM-D-984810)	INSPECT INSPECT REPAIR TEST			0.10		0.10 0.60 0.30	11 03, 06, 08, 11 03, 11	FT1 DT1 DT3 DT2
1205	CABLE ASSEMBLY (FILTER) (PN SM-D-876402)	INSPECT TEST REPLACE INSPECT REPAIR TEST			0.10 0.20 0.50		11 03, 11 11 0.10 0.60 0.20	11 03, 06, 08, 11 03, 11	FT1 FT2 FT4 DT1 DT3 DT2

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR MULTIPLEXER TD-1236/G

TOOL OR TEST EQUIPMENT REF. CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER
02	H, D	TEST STATION, ELECTRONIC EQUIPMENT AN/USM-410 (XE-3) WITH INTERFACE ADAPTERS	6625-00-614-9535
03	F, H, D	MULTIMETER DIGITAL AN/PSM-45**	6625-01-139-2512
04	H, D	DIGITAL CARD TESTER AN/USM-465A WITH INTERFACE ADAPTERS	6625-01-126-2473
05	F, H, D	OSCILLOSCOPE OS-261/U (TEK-475)	6625-00-127-0079
06	H, D	BENCH REPAIR FACILITY, PACE PRC-350C**	4940-00-031-4541
07	D	WIREWRAPE TOOL, GARDNER DENVER, 14 x A2 W/SLEEVE, RIT AND UNWRAPPING TOOL FOR AWG 30 WIRE	---
08	D	CONTACT TOOL KIT	---
09	O, F, D	BITE CAPABILITY	---
10	D	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5180-00-064-5178
11	H, F, D	TOOL KIT, ELECTRONIC EQUIPMENT TK-105/G*	5180-00-610-8177
14	F	BREAKOUT TEST CABLES, G285557-1	
19	D	GROUP SIMULATOR SDG 210963	
20	D	TIMING SOURCE SDG 210793	
30	F	SIGNAL GENERATOR HP-8660C Opt. 001, 3	6625-01-003-7414
31	F	RF PLUG-IN HP-86601A	6625-01-008-2166
32	F	AUXILIARY PLUG-IN HP-866318	6625-00-356-3172
33	F	PULSE GENERATOR SG-1105, (HP-80138)	6625-01-010-3524
47	D	BREAKOUT TEST CABLES *ITEM 11, ADDITIONAL HAND TOOLS REQUIRED, NOT SUPPLIED IN TK-105/G: SOCKET WRENCH SET **OR AIR FORCE EQUIVALENT	5120-00-542-5799

Section IV. REMARKS FOR MULTIPLEXER TD-1236/G

REF CODE	TASK	REMARKS
<u>UNIT LEVEL MAINTENANCE TASKS (DETAILED)</u>		
A	INSPECT	VISUALLY INSPECT UNIT/ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC. USE AUTHORIZED TOOL KIT (TK-101/G OR TK-105/G).
B	SERVICE	SERVICE EXTERIOR UNIT - CLEAN, DUST, AND REMOVE DIRT, GREASE, FUNGUS, ETC., AS NECESSARY.
C	REPAIR	USING TK-101/G TOOL KIT, REMOVE COVER ASSEMBLY. FAULT LOCATE BY OBSERVING EACH CCA FOR AN ILLUMINATED LED (BITE INDICATION). TEST EXTERNAL LAMP CIRCUITS. CHECK SWITCHES FOR PROPER INDICATION AND FREEDOM OF MOVEMENT. REPAIR OF UNIT LIMITED TO REPLACEMENT OF LAMP BULBS AS REQUIRED. REPLACEMENT OF CCAs IS ADDRESSED AT LOWER INDENT.
D	TEST	USING TK-105/G TOOL KIT, INTERNAL BITE AND AUTHORIZED TEST EQUIPMENT, PERFORM LOOPBACK TESTS, CHECK FRONT PANEL CONTROLS AND INDICATORS AND MAKE APPROPRIATE CONTINUITY CHECKS.
E	REPAIR	REPAIR OF UNIT LIMITED TO REAR CONNECTOR ASSEMBLY COMPONENTS, USING TK-105/G TOOL KIT, AND REPLACEMENT OF DEFECTIVE CCAs. AFTER REPAIR, TEST UNIT USING INTERNAL BITE AND AUTHORIZED TEST EQUIPMENT.
F	OVERHAUL	OVERHAUL OF UNIT AT DEPOT CONSISTS OF THE INSPECTION, TEST, AND REPAIR/REPLACEMENT OF CASE ASSEMBLY MOUNTED COMPONENTS AND CONNECTOR ASSEMBLY COMPONENTS AND THE REPLACEMENT OF ALL CIRCUIT CARD ASSEMBLIES. THE OVERHAUL OF THIS UNIT MAY USE ALL AUTHORIZED TOOLS AND TEST EQUIPMENT INDICATED ON THIS MAC.
G*	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN AND TOUCH UP AFFECTED AREAS OF THE CCA.
H	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.

Section IV. REMARKS—Continued

REF CODE	TASK	REMARKS
<u>ORGANIZATIONAL MAINTENANCE TASKS (DETAILED)</u>		
OT1	INSPECT	USING TK-101/G TOOL KIT AS REQUIRED, VISUALLY INSPECT CCA OR ASSEMBLY FOR BITE INDICATION, DAMAGE, DEFECTS, CRACKS, CORROSION, ETC.
OT2	REPLACE	USING TK-101/G TOOL KIT, REMOVE COVER ASSEMBLY AS NECESSARY, THEN REMOVE AND REPLACE FAULTY CCAs OR ASSEMBLIES AS REQUIRED.
<u>DIRECT SUPPORT MAINTENANCE TASKS (DETAILED)</u>		
FT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC.
FT2	TEST	USING TK-105/G TOOL KIT AND AN/PSM-45 DIGITAL MULTIMETER AS NECESSARY, TEST ASSEMBLY MAKING CONTINUITY AND SHORTS MEASUREMENTS. PERFORM INTERNAL BITE CHECKS AS APPLICABLE.
FT3	REPAIR	USING AN/PSM-45 DIGITAL MULTIMETER, FAULT LOCATE ASSEMBLY, MAKING CONTINUITY AND SHORTS MEASUREMENTS. USING TK-105/G TOOL KIT, REPLACE FRONT PANEL COMPONENTS OR CONNECTORS AS REQUIRED. NOTE: REAR CONNECTOR ASSEMBLY REPAIR IS LIMITED TO REPLACEMENT OF MECHANICAL COMPONENTS, (I.e., HANDLES, GASKET MATERIAL, FIELD WIRE POSTS AND COAX CONNECTORS WHERE APPLICABLE).
FT4	REPLACE	USING TK-105/G TOOL KIT, REPLACE ASSEMBLY AS REQUIRED.
<u>SRA MAINTENANCE TASKS (DETAILED)</u>		
HT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC.
HT2	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL, AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN, AND TOUCH UP AFFECTED AREAS OF THE CCA.
HT3	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.
<u>DEPOT MAINTENANCE TASKS (DETAILED)</u>		
DT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC. (REFER TO DMWR.)
DT2	TEST	USING AN/PSM-45 DIGITAL MULTIMETER, TEST ASSEMBLY MAKING CONTINUITY AND SHORTS MEASUREMENTS. (REFER TO DMWR.)
DT3	REPAIR	USING TK-105/G TOOL KIT, WIREWRAP TOOL, CONTACT TOOL KIT, PRC-350C BENCH REPAIR FACILITY, AND AN/PSM-45 DIGITAL MULTIMETER AS REQUIRED, REPAIR ASSEMBLY AS NECESSARY. (REFER TO DMWR.)
DT4	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL, AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN, AND TOUCH UP AFFECTED AREAS OF THE CCA.
DT5	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items for the TGM to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The components of End Item List are divided into the following sections:

a. Section II. Components of End Item. (Not applicable)

b. Section III. Basic Issue Items. These are the minimum essential items required to place the TGM in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the TGM during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column 1, Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column 2, National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

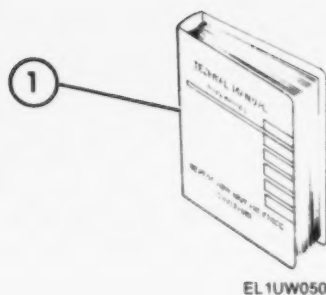
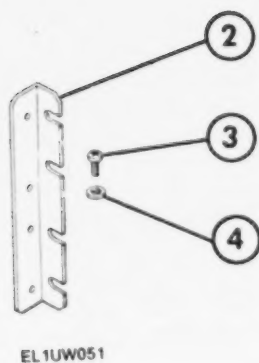
c. Column 3, Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

C-3. EXPLANATION OF COLUMNS—Continued

d. Column 4, Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr).

e. Column 5, Quantity Required (Qty Rqd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section III. BASIC ISSUE ITEMS



(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqd
1	N/A	Technical Manual TM 11-5805-697-12	Ea	1
2	N/A	Mounting Bracket	Ea	2
3	5305-00-059-3659	Mounting Screw	Ea	8
4	5310-00-619-1148	Flat Washer	Ea	8

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the TGM. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "use cleaning rag, item 2, Appendix E").

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C	Operator or Crew
O	Organizational Maintenance
F	Direct Support Maintenance
H	General Support Maintenance

c. Column 3, National Stock Number. This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	0	6850-00-105-3084	Cleaning compound, trichlorotrifluoroethane (80244) MIL-C-81302	Pt
2	0	8305-00-267-3015	Cheesecloth (81348) CCCC440	yd

GLOSSARY

<u>Word</u>	<u>Meaning</u>
Buffer	An intermediate storage to facilitate transfer of data between two mediums whose phase and/or frequency have unpredictable relationship.
Converter	A device used to change a signal from one form to another.
Data	Any or all facts, numbers, letters, symbols, or information that can be processed or produced by a computer.
Data Stream	All data transmitted through a path in a single input or output operation.
Demultiplex	The process by which one data stream is separated into two or more independent signals.
Energize	To activate or turn on.
Faults	Error or indication that something is wrong with the equipment.
Format	The way in which the data is arranged on the bit stream.
Frame	The array of bits between two frame bits.
Group	More than one channel combined into a single signal.
Malfunction	Error or indication that something is wrong with the equipment.
Microcontroller	Circuits used in DGM to control the synchronous operation of the equipment.
Modem	A modulation/demodulation device that: 1. Takes signals from sources such as multiplexers and generates waveforms suitable to the transmission medium. 2. Takes signals from the transmission medium and converts that to a form suitable for data processing in demultiplexers.
Multiplexer	A device used to combine two or more signals for transmission over a single channel.

GLOSSARY—Continued

<u>Word</u>	<u>Meaning</u>
Nonreturn to Zero	A signal having two states termed zero and one, and no neutral or reset condition.
Rectified Ac	Ac current which has been converted into pulsating dc.
Resync	The process of putting a signal back on a regular timing pattern.
Station Clock	A clock signal originating in the system.
Supergroup	A group formed by combining four synchronous groups.
Synchronous	Having a regular timing pattern.
Timing	A signal used to identify bits in a digital stream.

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DOPE ABOUT IT ON THIS
FORM. CAREFULLY TEAR
IT OUT, FOLD IT AND
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FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS) 1
Commander
Stateside Army Depot
Attn: AMSTA-US
Stateside, NJ 07703-5007

DATE SENT

PUBLICATION NUMBER

TM 11-5840-340-12

PUBLICATION DATE

23 Jan. 1974

PUBLICATION TITLE

Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO. PARA. GRAPH FIGURE NO. TABLE NO.

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2-28

IN THIS SPACE TELL WHAT IS WRONG
AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it gusts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.

3-10

3-3

3-1

Item 3 in column. Change "2 dB" to "3 dB."

REASON: The adjustment procedure the TRANS POWER FAULT indicator calls for a 3 dB (500 watts) adjustment to light the TRANS POWER FAULT indicator.

5-6

5-8

F03

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC" to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

SSG I. M. DeSpirito 999-1776

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I. M. DeSpirito

DA FORM 2028-2
JUL 79

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OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

SAMPLE

Commander
US Army Communications-Electronics Command
and Fort Monmouth
ATTN: DRSEL-ME-MP
Fort Monmouth, New Jersey 07703-5007

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Multiplexer TD-1236/G

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TABLE
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AND WHAT SHOULD BE DONE ABOUT IT:

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PIN : 056338-000